Volume II, Pages 2107-7399

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

14-1297

_____

OPLUS TECHNOLOGIES, LTD.,
Plaintiff-Appellee,

v.

VIZIO, INC.,
Defendant-Appellant

SEARS HOLDINGS CORPORATION,
Defendant.

_____

Appeal from the United States District Court for the Central District of California
in Case No. 12-cv-5707, Senior District Judge Mariana R. Pfaelzer

_____

CORRECTED NONCONFIDENTIAL JOINT APPENDIX
_____

Dated: November 13, 2014

OPLUS TECHNOLOGIES, LTD. V. VIZIO, INC., APPEAL NO. 14-1297 (FED. CIR.)

JOINT APPENDIX

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A1 - A18	123	04/05/2013	Stipulated Protective Order
A19 - A37	220	02/03/2014	Order Denying Defendant VIZIO, Inc.'s Motion for Attorneys' Fees and Expert Witness Fees
A38 - A61	183	10/02/2013	Order Granting In Part and Denying In Part Defendant VIZIO, Inc.'s Motion for Summary Judgment of Invalidity, Granting Defendant VIZIO's Motion for Summary Judgment of Noninfringement, and Denying Plaintiff Oplus Technologies, Ltd.'s Motion to Compel
A62 - A63	185	10/17/2013	Judgment in Favor of VIZIO, Inc. of Noninfringement of U.S. Patent Nos. 6,239,842 and 7,271,840 and Invalidity of U.S. Patent No. 6,239,842
A64 - A96	N/A	N/A	Docket Sheet – *Oplus Technologies, Ltd. v. Sears Holdings Corporation, et al.*, Case No. 2:12-cv-5707 (C.D. Cal.)
A97 - A102	N/A	N/A	Docket Sheet – *In re: Oplus Technologies, Ltd. Patent Litigation*, MDL No. 2400 (J.P.M.L.)
A103 - A115	N/A	N/A	U.S. Patent No. 6,239,842
A116 - A131	N/A	N/A	U.S. Patent No. 7,271,840
A132 - A162	N/A	07/24/2012	Transcript – Scheduling Conference
A249 - A316	N/A	02/27/2013	Transcript – Motion for Summary Judgment Hearing
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A378			Subpoena Hearing
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A538 - A543	14	12/20/2011	Corrected First Amended Complaint by Oplus Technologies, Ltd. against Sears Holdings Corporation, VIZIO, Inc.
A576 - A582	14-3	12/20/2011	Exhibit C to Corrected First Amended Complaint
A583 - A591	14-4	12/20/2011	Exhibit D to Corrected First Amended Complaint
A641 - A644	36	03/20/2012	Motion by Defendant VIZIO, Inc. to sever and transfer claims against VIZIO and stay claims against Sears
A876 - A888	44	06/15/2012	Memorandum Opinion and Order entered by the Honorable Robert M. Dow, Jr on 6/15/2012
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A1144 - A1172	95	11/26/2012	Plaintiff Oplus Technologies, Ltd.'s Opening Claim Construction Brief
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A1314 - A1320	101	01/07/2013	Notice of Motion and Motion for Summary Judgment as to Invalidity of U.S. Patents Nos. 6,239,842 and 7,271,840 Under 35 U.S.C. 101 and 112
A1454 - A1471	101-16	01/07/2013	Declaration of Dr. Sheila S. Hemami
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A1538 - A1568	108	02/04/2013	Opposition to Motion for Summary Judgment as to Invalidity of U.S. Patents Nos. 6,239,842 and 7,271,840 Under 35 U.S.C. 101 and 112
A1651 - A1671	108-10	02/04/2013	Declaration of Richard Ferraro
A1778 - A1829	113	03/04/2013	Order Denying Vizio, Inc.'s Motion for Summary Judgment
A1830 - A1901	114	03/20/2013	Joint Stipulation re: Oplus' Motion to Compel Production of Documents
A1902 - A1906	114-1	03/20/2013	(Attachments: # (1) Exhibit 1)
A1945 - A1956	114-7	03/20/2013	(Attachments: # (7) Exhibit C)
A2009 - A2076	117-3	04/01/2013	(Attachments: # (3) Exhibit B to Koole Declaration)

OPLUS TECHNOLOGIES, LTD. V. VIZIO, INC., APPEAL NO. 14-1297 (FED. CIR.)

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A2130 - A2251	126-4	05/17/2013	Declaration of Charles C. Koole
A2252 - A2259	126-5	05/17/2013	Exhibit A to Koole Decl.
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A2735 - A2737	139	06/14/2013	Notice of Amended Infringement Contentions filed by Plaintiff Oplus Technologies, Ltd..
A2738 - A2764	139-1	06/14/2013	Exhibit A to Notice of Amended Infringement Contentions
A2765 - A2774	139-2	06/14/2013	Exhibit B to Notice of Amended Infringement Contentions
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A2810			Infringement Contentions
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A2816 - A2818	148	07/29/2013	Notice of Motion and Motion for Summary Judgment as to Noninfringement of U.S. Patent Nos. 6,239,842 and 7,271,840 filed by Defendant VIZIO, Inc..
A2819 - A2849	153	07/29/2013	Memorandum of Points and Authorities in Support of Motion for Summary Judgment of Noninfringement
A2873 - A2877	148-3	07/29/2013	Declaration of Charles C. Koole in Support of Motion for Summary Judgment of Noninfringement
A2910 - A2986	148-6	07/29/2013	Exhibit 3 to Koole Declaration
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A4259 - A4261	150	07/29/2013	Notice of Motion and Motion for Summary Judgment as to Invalidity of U.S. Patents Nos. 6,239,842 and 7,271,840 filed by Defendant VIZIO, Inc.
A4262 - A4292	150-1	07/29/2013	Memorandum of Points and Authorities in support of VIZIO's Motion for Summary Judgment of Invalidity of U.S. Patents Nos. 6,239,842 and 7,271,840
A4462 - A4476	150-11	07/29/2013	Exhibit 8 to Declaration of Charles Koole

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A5315	211-4	11/25/2013	Exhibit AZ to Supplemental Declaration of Charles C. Koole
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A5595 - A5598	156-1	08/16/2013	Declaration of Gabriel I. Opatken
A5599 - A5602	156-2	08/16/2013	Exhibit A to Declaration of Gabriel I. Opatken
A5603 - A5605	156-3	08/16/2013	Exhibit B to Declaration of Gabriel I. Opatken
A5608 - A5613	156-5	08/16/2013	Exhibit D to Declaration of Gabriel I. Opatken
A5793 - A5795	157	08/16/2013	Notice of Motion re: Joint Stipulation re: Oplus' Motion to Compel Discovery
A5796 - A5820	159	08/19/2013	Oplus' Response to Vizio, Inc.'s Motion For Summary Judgment of Invalidity
A5853 - A5855	159-2	08/19/2013	Declaration of Daniel Ferri
A6221 - A6246	171	08/19/2013	Opposition to Motion for Summary Judgment as to Noninfringement of U.S. Patent Nos. 6,239,842 and 7,271,840
A6290 - A6295	160-2	08/19/2013	Declaration of Daniel R. Ferri
A6373 - A6476	160-4	08/19/2013	Exhibit B to Declaration of Daniel R. Ferri
A6477 - A6483	160-5	08/19/2013	Exhibit C to Declaration of Daniel R. Ferri
A6484 - A6487	160-6	08/19/2013	Exhibit D to Declaration of Daniel R. Ferri
A6488 - A6525	160-7	08/19/2013	Exhibit E to Declaration of Daniel R. Ferri
A6567 - A6609	160-9	08/19/2013	Exhibit G to Declaration of Daniel R. Ferri
A6610 - A6703	160-10	08/19/2013	Exhibit H to Declaration of Daniel R. Ferri
A6749 -	160-11	08/19/2013	Exhibit J to Declaration of Daniel R.

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A6752			Ferri
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A7385 - A7402	180	08/26/2013	Exhibit 23 to Supplemental Declaration of Charles Koole

CONFIDENTIAL MATERIAL OMITTED

The material omitted in Appendix Page Range A3003-3034, A7368-7384, and A7385-7402 includes testimony from a VIZIO witness describing VIZIO's business strategy.

OPLUS TECHNOLOGIES, LTD. V. VIZIO, INC., APPEAL NO. 14-1297 (FED. CIR.)

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A7539 - A7594	195	10/31/2013	Memorandum of Points and Authorities in Support of Defendant Vizio, Inc.'s Motion for Attorneys' Fees and Expert Witness Fees Pursuant to 35 U.S.C. Section 285, 28 U.S.C. Section 1927, and the Court's Inherent Power.
A7597 - A8049	196	10/31/2013	Declaration of Charles C. Koole in Support of Defendant Vizio, Inc.'s Motion for Attorneys' Fees and Expert Witness Fees Pursuant to 35 U.S.C. Section 285, 28 U.S.C. Section 1927, and the Court's Inherent Power, and Exhibits Thereto
A8052 - A8084	206	11/18/2013	Plaintiff's Opposition to Vizio's Motion for Attorneys' Fees and Expert Witness Fees Pursuant to 35 U.S.C. Section 285, 28 U.S.C. Section 1927, and the Court's Inherent Power
A8085 - A8096	203	11/18/2013	Declaration of Daniel R. Ferri in opposition to Motion for Attorney Fees and Expert Witness Fees Pursuant to 35 U.S.C. 285, 28 U.S.C. 1927, and the Court's Inherent Power
A8136 - A8435	203-3	11/18/2013	Exhibit C Part 1 to the Declaration of Daniel R. Ferri

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A9437 - A9443	203-10	11/18/2013	Exhibit D to the Declaration of Daniel R. Ferri
A9444 - A9455	203-11	11/18/2013	Exhibit E to the Declaration of Daniel R. Ferri
A9468 - A9478	203-14	11/18/2013	Exhibit H to the Declaration of Daniel R. Ferri
A9479 - A9497	203-15	11/18/2013	Exhibit I to the Declaration of Daniel R. Ferri
A9504 - A9565	203-17	11/18/2013	Exhibit K to the Declaration of Daniel R. Ferri
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A9593 - A9595	203-20	11/18/2013	Exhibit N to the Declaration of Daniel R. Ferri
A9596 - A9599	203-21	11/18/2013	Exhibit O to the Declaration of Daniel R. Ferri
A9600 - A9601	203-22	11/18/2013	Exhibit P to the Declaration of Daniel R. Ferri
A9602 - A9607	203-23	11/18/2013	Exhibit Q to the Declaration of Daniel R. Ferri
A9608 - A9609	203-24	11/18/2013	Exhibit R to the Declaration of Daniel R. Ferri
A9610 - A9614	203-25	11/18/2013	Exhibit S to the Declaration of Daniel R. Ferri
A9615 - A9617	203-26	11/18/2013	Exhibit T to the Declaration of Daniel R. Ferri
A9618 - A9621	203-27	11/18/2013	Exhibit U to the Declaration of Daniel R. Ferri
A9622 - A9630	203-28	11/18/2013	Exhibit V to the Declaration of Daniel R. Ferri
A9631 - A9640	203-29	11/18/2013	Exhibit W to the Declaration of Daniel R. Ferri
A9656 - A9679	203-31	11/18/2013	Exhibit Y to the Declaration of Daniel R. Ferri

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A9686 - A9759	203-33	11/18/2013	Exhibit AA to the Declaration of Daniel R. Ferri
A9760 - A9762	203-34	11/18/2013	Exhibit AB to the Declaration of Daniel R. Ferri
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A10029 - A10030	203-45	11/18/2013	Exhibit AM to the Declaration of Daniel R. Ferri
A10031 - A10032	203-46	11/18/2013	Exhibit AN to the Declaration of Daniel R. Ferri
A10033 - A10044	203-47	11/18/2013	Exhibit AO to the Declaration of Daniel R. Ferri
A10059 - A10101	203-49	11/18/2013	Exhibit AQ to the Declaration of Daniel R. Ferri
A10492 - A10495	211-2	11/25/2013	Supplemental Declaration of Charles C. Koole
A10515 - A10516	211-5	11/25/2013	Exhibit BA Supplemental Declaration of Charles C. Koole
A10517 - A10518	211-6	11/25/2013	Exhibit BB to Supplemental Declaration of Charles C. Koole
A10601 - A10604	218	12/16/2013	Declaration of Raymond P. Niro
A10738 - A10738	2 (MDL)	07/24/2012	Motion to Transfer (Amended) Filed by: Oplus Technologies
A10943	17-23 (MDL)	08/14/2012	Exhibit F to Declaration of James J. Lukas
A11062 - A11064	26 (MDL)	10/03/2012	Order Denying Transfer
A11065 - A11067	93 (1:11-cv-08539)	09/03/2014	Order
A11068 - A11075	84 (1:11-cv-08539)	07/28/2014	Report and Recommendation
A11076 - A11089	N/A	12/09/2013	PowerPoint Presentation Used by Plaintiff at Hearing on December 9, 2013

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A11090 - A11107	N/A	02/28/2013	Non-party MediaTek USA Inc.'s Objections and Responses to the "Subpoena to Produce Documents, Information, or Objects to Permit Inspection of Premises in a Civil Action" Dated February 14, 2013 and Issued by Oplus Technologies, Ltd.
A11108 - A11141	N/A	02/28/2013	Non-party Qualcomm Incorporated's Responses and Objections to Oplus Technologies, Ltd.'s Subpoena to Produce Documents, Etc. and Subpoena to Testify at Deposition in a Civil Action
A11142 - A11153	N/A	03/01/2013	Non-party Witness STMicroelectronics, Inc.'s Responses and Objections to Plaintiff's Subpoenas for Production of Documents and Testimony
A11154 - A11164	364 (6:11-cv-00421)	08/06/2014	Order and Opinion Denying Attorney's Fees
A11165 - A11183	62 (1:11-cv-08539)	05/16/2014	Amended Memorandum of Points and Authorities in Support of Defendant VIZIO, Inc.'s Motion for Attorneys' Fees and Expenses Pursuant to 35 U.S.C. § 285, 28 U.S.C. § 1927, and the Court's Inherent Power
A11184 - A11299	62-1 (1:11-cv-08539)	05/16/2014	Amended Declaration of Adrian M. Pruetz in Support of Defendant VIZIO, Inc.'s Motion for Attorneys' Fees and Expenses Pursuant to 35 U.S.C. § 285, 28 U.S.C. § 1927, and the Court's Inherent Power
A11300 - A11301	98 (1:11-cv-07539)	09/10/2014	Order Denying Oplus Technologies, Ltd.'s Motion for Attorneys' Fees and Expenses
A11302 - A11305	84 (1:10-cv-04298)	12/07/2012	Order Granting Defendant's Motion for Attorneys' Fees and Expenses in *Illinois Comp. Res. v. Best Buy Stores, L.P.,*

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			Case No. 1:10-cv-04298, Dkt. 84 (N.D. Ill. Dec. 7, 2012)
A11306 - A11327	340 (9:09-cv-81046)	08/31/2012	Order Granting Motion for Fees and Costs, Requesting Submission of Materials for In Camera Review and Granting Motion to Strike in *Innovative Biometric Tech., LLC v. Toshiba Am. Info. Sys., Inc.,* Case No. 9:09-cv-81046 (S.D. Fla. Aug. 31, 2012)

CONFIDENTIAL MATERIAL OMITTED

The material omitted in Appendix Page Range A9566-9575 includes testimony from a VIZIO witness describing VIZIO's business strategy.

The material omitted in Appendix Page Range A7539-7594 describes confidential details of Oplus Technologies, Ltd.'s business, including the purchase price of the patent portfolio including the patents that were at issue in this case.

The material omitted in Appendix Page Range A7597-8049 includes VIZIO counsel's confidential invoices to VIZIO for the fees it incurred in this action.

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES - GENERAL

Case No.	12-cv-05707-MRP-E		Date	4/3/2013
Title	Oplus Techs, Ltd. v. Sears Holding Corp. and Vizio, Inc.			

Present: The Honorable	**MARIANA R. PFAELZER**	
Isabel V. Martinez	None	N/A
Deputy Clerk	Court Reporter / Recorder	Tape No.
Attorneys Present for Plaintiff:		Attorneys Present for Defendant:
None		None

Proceedings: **(In Chambers)**

Order Re ECF Nos. 114, 115

Vizio has objected to Oplus's discovery requests on the basis that Oplus's infringement contentions are deficient. Oplus moves to compel this discovery and extend the case schedule. In its motion, Oplus characterizes Vizio's complaints about its infringement contentions as improper tit-for-tat objections. Are they that?

An affirmative answer rests on the assumption that infringement contentions are somehow decoupled or estranged from the rest of the discovery process such that Vizio's citation of their defects is tantamount to a tit-for-tat objection. The relationship between infringement contentions and discovery is hardly estranged. Infringement contentions were originally devised as a streamlined mechanism to replace the series of interrogatories defendants would have propounded in their absence. The purpose was to provide structure to the entire discovery process. It was also intended to require the patentee to crystallize its infringement theory early in the case and adhere to it once disclosed.

J. Gilstrap in the Eastern District of Texas recently opined, "[I]nfringement contentions are not intended to impose rigid boundaries that confine the scope of discovery . . . ." *DDR Holdings, LLC v. Hotels.com*, No. 2:06-cv-42-JRG (E.D. Tex., July 18, 2012). This is a sound proposition, to which this Court adds a minor alteration. "Adequate" contentions are not intended to limit discovery, only to provide structure to it. But where contentions are inadequate, courts have not only limited discovery, they have stayed it entirely. *Bender v. Maxim Integrated Prods., Inc.*, 2010 WL 1135762 (March 22, 2010) ("Until plaintiff meets the burden of providing infringement contentions compliant with Patent L.R. 3-1, the Court will not order defendant to

A002107

LINKS: 114, 115

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES - GENERAL

Case No.	12-cv-05707-MRP-E	Date	4/3/2013
Title	Oplus Techs, Ltd. v. Sears Holding Corp. and Vizio, Inc.		

proceed with discovery.").

      Chief Judge Rader has made this point time and time again in conferences and articles. This Court should strive to "tailor its timing and procedures to make sure a billion-dollar case gets a 'billion-dollar' process and a thousand-dollar case gets its due as well." C.J. Randall R. Rader, *The State of Patent Litigation*, 21 Fed. Circuit B.J. 331, 335 (2011-12). "[T]he greatest weakness of the U.S. court system is its expense." *Id.* at 336. And the driving factor for that expense is discovery excesses." *Id.* This Court could not agree more. Assessing the adequacy of infringement contentions when adjudicating motions to compel is one way to heed the Chief's advice.

      Over a half year ago, on September 18, 2012, Vizio wrote to Oplus expressing its concern regarding Oplus's infringement contentions. This twelve-page single-spaced email is reflective of the considerable effort Vizio has devoted to Oplus's contentions. The Court has also combed through Oplus's infringement contentions. These contentions reflect that Oplus has researched Vizio's products down to three layers of granularity: (1) product; (2) technology; and (3) technique. Vizio's televisions are the product. Silicon Optics HQV, Faroudja, and Mediatek are the technologies incorporated in these products. And 3:2 deinterlacing, motion-adaptive deinterlacing, motion-adaptive noise reduction, and second-stage diagonal interpolation are examples of signal processing techniques pertinent to these technologies incorporated in Vizio's products. That is the level of granularity at which the contentions stop. Is that enough? If so, Oplus is implying that its infringement theory is as follows: if Vizio uses *any* of these techniques, it must practice Oplus's patent. Even *this* is acceptable at the pre-discovery stage of a litigation *but if and only if* Oplus's infringement theory is indeed that *any* 3:2 deinterlacing algorithm infringes. Or that *any* motion-adaptive deinterlacing technique infringes. And so on. Of course, this does not appear to *fit* the more detailed level of granularity at which the PTO has issued the claims that Oplus has asserted against Vizio. For example, Claim 56 has four sub-steps just *within* the entropy-determination step, which in turn is one of the sub-steps of the method claim.

      Vizio has asked Oplus pointed questions about the level of granularity attaching to its infringement theories in its September 18, 2012, letter. (In fact, a Ctrl-F word search of the September 18, 2012 letter for the '?' character reveals a handy, though partial, blueprint for amending these contentions.) Answers to these questions will provide structure to the pending discovery process. Leaving them unanswered has had the opposite effect so far. And in the current morass of unstructured discovery caused by these inadequate infringement contentions, the patentee's instant motion to compel does not garner much sympathy. The Court therefore **DENIES** Oplus's motion to compel.

CV-90 (06/04)	**CIVIL MINUTES - GENERAL**	Page 2 of 3

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES - GENERAL

Case No.	12-cv-05707-MRP-E		Date	4/3/2013
Title	Oplus Techs, Ltd. v. Sears Holding Corp. and Vizio, Inc.			

On the issue of the fact discovery deadline, however, the Court is somewhat more sympathetic. Thus, the Court extends the close of fact discovery to May 15, 2013, i.e., a one-month extension.

IT IS SO ORDERED.

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14

15   UNITED STATES DISTRICT COURT
              CENTRAL DISTRICT OF CALIFORNIA
16   WESTERN DIVISION

17 OPLUS TECHNOLOGIES, LTD.,   CASE NO.: CV12-5707 MRP (Ex)

18   Hon. Judge Mariana R. Pfaelzer
            Plaintiff,
19   **VIZIO, INC.'S NOTICE OF**
                                       MOTION AND MOTION FOR
20 v.   **PROTECTION FROM SUBPOENA**
                                       ISSUED IN VIOLATION OF
21 SEARS HOLDINGS CORPORATION;   **MULTIPLE COURT ORDERS**
22 VIZIO, INC.,   **AND PROHIBITING USE OF**
                                       SUBPOENAED DOCUMENTS
23   Defendants.
                                       DATE: June 17, 2013
24   TIME: 11:00 a.m.
                                       PLACE: Courtroom 12
25

26

27

28
   ───
   VIZIO'S NOTICE OF MOTION AND MOTION FOR PROTECTION FROM UNLAWFUL SUBPOENA AND
              PROHIBITING USE OF SUBPOENAED DOCUMENTS

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A002110

1   PLEASE TAKE NOTICE that at 11:00 a.m. on June 17, 2013, or as soon

2   thereafter as counsel may be heard, Defendant VIZIO, Inc. ("VIZIO") will, and

3   hereby does, move this Court, the Honorable Mariana R. Pfaelzer presiding, pursuant

4   to the terms of the Stipulated Protective Order entered by the court in the case entitled

5   *IP Innovation LLC, et al. v. VIZIO, Inc., et al.,* Case No. 1:08-cv-00393 (N.D. Ill.), for

6   "judicial protection from the enforcement of the subpoena" served by counsel for

7   plaintiff Oplus Technologies, Ltd. ("Oplus") on May 3, 2013, commanding Oplus

8   counsel (as counsel for its former client, Technology Licensing Corp.), to produce

9   documents in Oplus counsel's own files containing confidential VIZIO information,

10 notwithstanding that those documents are subject to a protective order prohibiting use

11 of confidential VIZIO documents and information outside of that action. VIZIO

12 further will, and hereby does, move this Court for "entry of an appropriate protective

13 order" prohibiting the use of the subpoenaed documents in this action.

14   This motion is based upon this Notice of Motion and Motion, the

15 accompanying Memorandum of Points and Authorities, the Declaration of Charles C.

16 Koole and exhibits thereto, the Declaration of Adrian M. Pruetz, all pleadings and

17 papers on file in this action, and upon such other matters as may be presented to the

18 Court at the time of the hearing.

19   This motion is made following the conference of counsel pursuant to L.R. 7-3,

20 which took place on May 10, 2013.

21

22 Dated: May 17, 2013   Respectfully submitted,

23   By: /s/ Adrian M. Pruetz__

24   Adrian M. Pruetz
                                        Charles C. Koole
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VIZIO'S NOTICE OF MOTION AND MOTION FOR PROTECTION FROM UNLAWFUL SUBPOENA AND
PROHIBITING USE OF SUBPOENAED DOCUMENTS

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VIZIO'S NOTICE OF MOTION AND MOTION FOR PROTECTION FROM UNLAWFUL SUBPOENA AND
PROHIBITING USE OF SUBPOENAED DOCUMENTS

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May 15, 2013

<u>***Via Electronic Mail***</u>
Charles C. Koole
GLASER WEIL FINK
10250 Constellation Boulevard, 19th Floor
Los Angeles, CA 90067
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Re: *Oplus Technologies v Sears Holdings Corp.*
        and Vizio, Inc., No. CV12-5707 MRP

Dear Charles:

    While we believe that the Plaintiffs' initial infringement contentions provided to Vizio contain the requisite detail required under the Local Rules, we wanted to address on a point by point basis the questions raised by your letter of September 18, 2012 such that we can finally get any discovery from Vizio about its accused products in response to our initial set of document requests served on September 6, 2012 and our amended interrogatories served on February 22, 2013 In order to break down your letter into a more manageable format, we have broken down each question (or group of questions, as appropriate) and addressed each in turn. Here are our responses:

    <u>Vizio Letter at 1-2</u>: "It is unclear whether Oplus contends that MediaTek motion adaptive de-interlacing *alone* is infringing, that 3:2 pull down detection *alone* is infringing, or that it is only a combination of MediaTek motion adaptive de-interlacing and 3:2 pull down detection that is infringing. Please clarify."

    <u>Answer</u>: The short answer is "none of the above." In Vizio's infringement of the '842 patent, as presently understood, the MediaTek ICs using MDDI have included 3:2 pulldown capability as part of the adaptive deinterlacing. Put another way, the steps which are performed

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by the accused Vizio products are incident to both the motion adaptive de-interlacing and 3:2 pull down detection which it performs, and 3:2 pulldown capability is part of the adaptive deinterlacing, though we are aware of nothing which requires the combination of such pulldown and adaptive deinterlacing features to practice the asserted claims of the '840.

Vizio Letter at 2: "The mere manufacture, sale, offer for sale and/or importation of a product cannot itself constitute infringement of a method claim. Therefore, please clarify which of the Section 271(a) acts Oplus contends VIZIO has committed and the basis for the contention."

Answer: Vizio has used its accused products as testified to by its corporate designees (see, e.g., the deposition of Mr. Lowe). See Also publicly available examples of Vizio's use of the accused televisions through displays provided at its suite at CES and other shows (see, e.g., http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; see also http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix).

Vizio Letter at 2: "Oplus apparently contends that all televisions and/or displays that "incorporat[e] Silicon Optix HQV technology" infringe the asserted claims of the '842 Patent. Infringement Contentions at 2. Please confirm whether that is the case, and please explain the meaning that Oplus ascribes to "Silicon Optix HQV technology" when using it in the Infringement Contentions."

Answer: Yes. Oplus also notes that the HQV deinterlacing is the trade name used for its suite of technologies which include video error correction and video enhancement processors.

Vizio Letter at 3: There are several areas of ambiguity in Oplus' application of its claims to "Silicon Optix HQV Technology." For example, is it Oplus' contention that any "pixel-based motion adaptive de-interlacing technology" is covered by the asserted '842 Patent claims? Infringement Contentions, Exh. A at 2. Is it Oplus' contention that the unspecified "video error correction and video enhancement processes" which comprise part of the HQV technology "suite" infringe the asserted '842 Patent claims? Infringement Contentions, Exh. A at 2. Please clarify.

Answer: Oplus does not anywhere suggest or state "that any 'pixel-based motion adaptive deinterlacing process' is covered by the asserted '842 Patent claims," nor is it our burden to provide contentions one way or the other to such a question. As for the "unspecified 'video error correction and video enhancement processes'" that allegedly comprise Oplus' assertions, Oplus respectfully notes that: 1) the preamble is the only part of the claim language which references "video error correction and video enhancement processes," and the parties have agreed that the preamble of the '842 is not a limitation, thus rendering any contentions related to the preamble irrelevant; and 2) the contentions provided in that preamble are not unspecified, but detail the pixel-based motion adaptive deinterlacing process within the video error correction and video enhancement processes.

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     <u>Vizio Letter at 3</u>: Please clarify the particular "evaluating" step that Oplus contends the accused products perform. Is it Oplus' contention that element (b) is met only by methods in which "missing pixels are identified through averaging"? Alternatively, does Oplus contend that element (b) is met by "processes [that] take a multitude of potential values to fill in for the missing pixels and perform logical operations upon them to determine the best fit value in light of the motion present" regardless of whether averaging is used? The corresponding element of claim 14 raises similar issues. Infringement Contentions, Exh. A at 9.

     <u>Answer</u>: No. The step can be met by averages of known values of spatial pixels, averages of known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between the averages of the known values of temporal pixels and the known values of the spatial pixels, the known values of said spatial pixels, and a plurality of constants as stated in the claim. The multitude of values referred to in the claim chart and shown pictorially in Exhibit 5 to the charts shows that the process includes evaluations include at least averaging known values of spatial pixels and averages of known values of temporal pixels.

     <u>Vizio Letter at 3-4</u>: In addition, Oplus identifies "'Second Stage' Diagonal Interpolation" as a technique that somehow relates to element (b) of claim 7 and the corresponding element of claim 14. Infringement Contentions, Exh. A at 4 and 9. It is not clear whether or how this relates to the asserted claims. Please explain how this process allegedly demonstrates the performance of the "evaluating" limitations of claims 7 and 14.

     <u>Answer</u>: Yes, this relates to claim element 7b and 14 as our charts stated previously. The fact that HQV's creator refers to what it admits is "second stage <u>interpolation</u>" supports the view that it is an additional function that is part of the deinterlacing process which is covered by the asserted claims of the '842 patent. As discussed above, the multitude of values referred to in the claim chart and shown pictorially in Exhibit 5 (including the pictoral displays of the "second stage interpolation" and the resulting changes in pixels) to the charts shows that the HQV process includes evaluations include at least averaging known values of spatial pixels and averages of known values of temporal pixels.

     <u>Vizio Letter at 4</u>: "Oplus apparently contends that all televisions and displays that 'incorporat[e] MediaTek motion adaptive deinterlacing technology' infringe the asserted claims of the '842 Patent. Infringement Contentions at 2. Please confirm whether that is the case and provide the meaning that Oplus ascribes to the phrase 'MediaTek motion adaptive deinterlacing technology' when using the phrase in its Infringement Contentions.

     <u>Answer</u>: Your understanding of what we stated previously in our claim charts is correct. The meaning that Oplus ascribes to "MediaTek motion adaptive deinterlacing technology" is another way of stating the trade name that Mediatek identifies as "MDDi."

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Vizio Letter at 4: "[I]t appears that Oplus is taking the position that any "motion adaptive de-interlacing technology" infringes the asserted '842 Patent claims. Please confirm whether that is the case. If it is not the case, please identify the specific aspects of the MediaTek MDDI motion adaptive de-interlacing technology that relate to the various claim limitations. Also, none of the cited exhibits indicate that the MediaTek de-interlacing technology is "pixel-based." Please clarify whether Oplus contends that it is pixel-based, and if so, identify the basis of its allegations.

Answer: No, Oplus is not taking the position that any motion adaptive de-interlacing technology infringes the 842 patent, nor is it Oplus' burden to take a position whether or not any such technology would infringe. Rather, it is Oplus' contention that any Vizio product using MediaTek MDDI motion adaptive de-interlacing technology does infringe the '842 patent. Further, while "pixel-based" is not found in the claim language in the '842 patent, Oplus is of the position that MediaTek MDDI motion adaptive de-interlacing technology is pixel-based as reflected, for instance, in the Mediatek patents cited in the claim chart previously provided.

Vizio Letter at 4-5: "MediaTek, Inc. has been assigned in excess of 2400 U.S. patents and/or patent applications. Therefore, please specify the basis on which Oplus has concluded that these two specific patents are practiced by the accused products. Please also specify the particular methods disclosed in the patents which Oplus contends are practiced in the accused products. For example, the '186 Patent discloses a method comprising calculating pixel intensity differences for a variety of pixel pairs, comparing the differences to thresholds, and then performing a logical "OR" operation to determine if motion is present. See '186 Patent at 5:30-6:35 and FIG. 8. Does Oplus contend that this method satisfies element (b) of claim 7 and the corresponding limitation of claim 14?

Answer: Our research has not reflected the existence of 2400 patents which were owned and filed as of the dates publicly available information from Mediatek touted its patent pending MDDI technology. If you share the basis for your statement (e.g., the search terms used), perhaps we could narrow the figure you cite. However that may be, we relied upon analysis provided by our consulting experts in identifying these patents as being ones which are believed to be practiced by Mediatek in the accused Vizio televisions using MDDi motion adaptive deinterlacing technology (though these are not the only such patents believed to be used by Mediatek). The aspects of these patents, as Oplus understand the matter, which are believed to demonstrate the presence of element 7b and the corresponding element in claim 14, were set forth in Oplus' claim charts in the best summary available, e.g., Col. 1:48-56 of the '186 (referencing what Oplus believes to be averages of known values of spatial pixels, averages of known values of temporal pixels) and U.S. Patent No. 6,456,329, Col. 4:45-64 (referencing what Oplus believes to be averages of known values of spatial pixels). With respect to the '186 patent at Col. 5:30- to Col. 6:35, this citation appears to reference the ability to dynamically adjust of the number of fields in a motion detection process. As presently advised, Oplus does not believe that such a feature is required by the claims and thus does not rely upon that passage.

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Vizio Letter at 5: Oplus apparently contends that all televisions or displays that use "Faroudja DCDi Technology" infringe the asserted claims of the '840 Patent. Infringement Contentions at 2. Please confirm whether that is the case. To the extent it is, Oplus' Infringement Contentions are nevertheless ambiguous as to the meaning Oplus ascribes to the phrase "Faroudja DCDi Technology." For example, Exhibit 24 to Oplus' Infringement Contentions references "Faroudja DCDi Cinema". According to the document, "Directional correlational deinterlacing (DCDi)" is a component of "Faroudja DCDi Cinema." Does Oplus contend that Faroudja's "Directional correctional deinterlacing" *alone* infringes the asserted '840 patent claims" or is the entire "Faroudja DCDi Cinema" that allegedly infringes the claims?

Answer: All of the versions of DCDi Cinema technology which we are aware of Vizio having used are believed to infringe the '840 patent. For instance, Vizio's and GV 46L10 televisions uses the Cortez chip, which is also known as the FLI 8532 (See, e.g., http://www.businesswire.com/news/home/20050502006018/en/LG-Designs-Genesis-Microchips-Cortez-Hudson-Video, equating Cortez and FLI 8532; See also http://www.gnss.com/products/Product%20Brief%20Cortez%20FLI8532.pdf, referencing FLI 8532 and DCDi cinema; See also, e.g., http://www.avrev.com/home-theater-flat-panel-hdtvs/lcd-hdtvs/vizio-gv46l-46-inch-lcd-hdtv.html; and http://www.encompassparts.com/shop/research_new/VIZ/GV46LHDTV10A.pdf; referencing the use of the FLI in Vizio's GV 46L10). Such DCDi Cinema technology represents a suite of video enhancement technologies which includes DCDi and 3D Noise Reduction. Oplus is unaware of Vizio products with DCDi, but lacking 3D noise reduction, and thus takes no position as to whether or not DCDi without 3D Noise reduction would fall within the claims of the '840 patent.

Vizio Letter at 5: Oplus' claim charts mention "motion adaptive noise reduction." However, does it contend that all products that use "Faroudja DCDi" also use "motion adaptive noise reduction"? Does it contend that any product using "motion adaptive noise reduction" infringes the asserted '840 Patent claims? If not, please identify the specific features of the motion adaptive noise reduction technology that are allegedly used in the accused products and how they relate to the asserted claim limitations.

Answer: All of the versions of DCDi technology which we are aware of Vizio having used are believed to include "motion adaptive noise reduction[.]" See the references above. Oplus believes that it does not bear the burden of proving whether or not any product using "motion adaptive noise reduction" would fall within the scope of the '840 patent in the absence of discovery showing how such "motion adaptive noise reduction" is performed. Oplus, however, does take the view that Vizio televisions including the suite of features in DCDi Cinema (with its motion adaptive noise reduction feature) do infringe.

Vizio Letter at 5: Is it Oplus' contention that any motion adaptive noise reduction process *necessarily* requires a determination of pixel entropy? If so, what support does Oplus have for this contention? Moreover, what is the basis for Oplus' assertion that the accused products include motion adaptive noise reduction?

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Answer: It is not Oplus' contention that "any motion adaptive noise reduction process necessarily requires a determination of pixel entropy;" rather, Oplus' contentions are limited strictly to the accused MDDI and DCDi Cinema technologies used in Vizio's products. As for the basis that DCDi cinema includes motion adaptive noise reduction, see the explanation of DCDi Cinema by ST technologies: "ST uses Motion Adaptive processing to reduce noise without introducing smearing." http://www.faroudja.com/faroudja/brands/dcdi-cinema.jsp.

Vizio Letter at 6: In addition, the distinguishing use of "Faroudja DCDi" and "motion adaptive noise reduction" in Exhibit 24 suggests that the use of Faroudja DCDi *alone* cannot possibly infringe the asserted claims. As this suggestion is contrary to the position taken by Oplus on page 2 of its Infringement Contentions, please clarify Oplus' position.

Answer: All of the versions of DCDi Cinema technology which we are aware of Vizio having used are believed to infringe the '840 patent. For instance, Vizio's and GV 46L10 televisions uses the Cortez chip, which is also known as the FLI 8532 (See, e.g., http://www.businesswire.com/news/home/20050502006018/en/LG-Designs-Genesis-Microchips-Cortez-Hudson-Video, equating Cortez and FLI 8532; See also http://www.gnss.com/products/Product%20Brief%20Cortez%20FLI8532.pdf, referencing FLI 8532 and DCDi cinema; See also, e.g., http://www.avrev.com/home-theater-flat-panel-hdtvs/lcd-hdtvs/vizio-gv46l-46-inch-lcd-hdtv.html; and http://www.encompassparts.com/shop/research_new/VIZ/GV46LHDTV10A.pdf; referencing the use of the FLI in Vizio's GV 46L10). Such DCDi Cinema technology represents a suite of video enhancement technologies which includes DCDi and 3D Noise Reduction. Oplus is unaware of Vizio products with DCDi, but lacking 3D noise reduction, and thus takes no position as to whether or not DCDi without 3D Noise reduction would fall within the claims of the '840 patent.

Vizio Letter at 6: Oplus asserts that "Vizio's Televisions . . . perform[] [their] edits in real time, and any error correction, performed must, by nature, be automatic." Infringement Contentions, Exhibit B at 8. Oplus fails to provide any examples of particular "errors" that have allegedly been corrected by the accused products. Please identify them.

Answer: An example of the errors which are referred to are cadence errors, which is well known by the person of ordinary skill in the art. Cadence errors are temporal errors, relating to errors, or noise in pixels in the sequential fields being received. Entropy is a measure of randomness, or stated another way a measure of the absence of similarity and lack of similarity in a given image is most frequently due to motion, detail or noise. Cadence errors produce a lack of similarity in sequential fields of the same image. Thus the comparison to detect noise as practiced by the accused products determines the entropy of the pixels.

Vizio Letter at 6: Claim 56 recites the step "(a) receiving and characterizing the streaming digital video image input signalduring a pre-determined time interval." Infringement Contentions, Exh. B at 9. Oplus apparently contends that the accused products meet this

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limitation because they allegedly use motion adaptive noise reduction. *Id.* As explained above, this contention is not supported by any of the product literature cited by Oplus. Therefore, please state the basis for Oplus' contention.

  Answer: The step (a) receiving and characterizing is performed, for example, by receiving both interlaced and progressive video inputs as set forth in the Vizio TV specifications of the Exhibits. Since progressive video inputs have no fields and interlaced video inputs do have fields, the video signal must be received (i.e. before it can be displayed) and characterized (e.g., so the TV knows if it needs to be de-interlaced).

  Vizio Letter at 6: Oplus does not even allege that this limitation is met, and at most, states that the accused products use *one* temporal field:

  The Motion Adaptive Noise Reduction of the Genesis chipsets utilized by the Vizio Televisions must consider *a temporal field* to detect motion with any accuracy, which is further indicated by the fact that the technology is based on temporal noise reduction filtering. Only through considering a temporally related portion of time may motion by properly detected to ensure that error correction does not affect motion to create the smearing or ghosting that Genesis warns of above.

  Infringement Contentions, Exh. B at 9 (emphasis added). Thus, please identify the basis, if any, for alleging that the accused products use two temporal fields in the manner specified by step (b).

  Answer: We respectfully disagree with your interpretation of our contentions. In step (b) the recitation of three consecutive refers to what is contained in a streaming digital interlaced video signal. The streaming signal in fact contains numerous temporal fields of video which is well understood by the person of ordinary skill in the art. Indeed, as the material cited above (an in our preliminary infringement contentions) make clear to those of skill the ability to switch between spatial and temporal fields by definition means that for a temporal field to exist, there must be additional fields to which the temporal field is considered. This fact is shown by the further Oplus description that "Only through considering a temporally related portion of time may motion be properly detected … ." Furthermore, the "2:3" (sic. 3:2) Pull Down shown in Exhibit 19 in our preliminary infringement contentions plainly requires the use of at least 3 consecutive fields.

  Vizio Letter at 7: With respect to step (b), Oplus further cites a third party website's characterization of Faroudja DCDi technology. Infringement Contentions, Exh. 25. However, the cited description of the technology says nothing about the use of temporal fields. Please explain the relevance of Exhibit 25 to this claim limitation.

  Answer: Exhibit 25 is a further example of the implementation of the 3d adaptive noise filter functions as identified above. However, since you apparently take issue with citation to "a third party website," we further invite you to refer to Faroudja's own discussion of spatial and

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temporal filter as a component of DCDi
Cinema. http://www.faroudja.com/faroudja/brands/dcdi-cinema.jsp   As with the discussion
above, we respectfully disagree with your contention that this evidence says nothing about the
use of temporal fields.

> Vizio Letter at 7: The claim expressly requires "determining the entropy," yet Oplus
provides no formula or method by which an entropy value is allegedly calculated by the accused
products. Does Oplus contend that this limitation is met simply by comparing pixels of temporal
fields? Does Oplus contend that an accused product need not calculate an entropy value to satisfy
this limitation? Please clarify. With respect to this same limitation, we note that Oplus
inconsistently goes on to state that the accused products "measure the value of other pixels in the
same spatial neighborhood across multiple temporally associated *frames*" rather than "fields."
Id. at 10-11. Does Oplus contend that this limitation is met by comparing pixel across multiple
frames rather than fields?

> Answer: The Oplus statement that the fields are compared to detect pixels affected by
noise is correct and there is no rewriting of the claim in the description of what takes place in the
Vizio product. Those of skill in the art would know that the claim deals with (among other
issues) cadence errors. Cadence errors are by definition temporal, relating to errors, or noise in
pixels of sequential fields. Entropy is a measure of randomness, or stated another way a measure
of the absence of similarity and lack of similarity in a given image is most frequently due to
motion, detail or noise. Cadence errors produce a lack of similarity in sequential fields of the
same image thus a comparison to detect noise is one manner of determining entropy of pixels,
real or virtual. Furthermore, with respect to the issue about frames, in a streaming interlaced
video signal each frame is comprised of two fields. Thus, four streaming fields may be
considered the same as two streaming frames for purposes of this claim, or it may be one field of
one frame, two fields of a second frame and one field of a third frame. There may be other
combinations as well which relate to this claim.

> Vizio Letter at 7: Oplus fails to identify the "weighted distances" that are allegedly used
to create the claimed "inter-local neighborhood parameters" in the accused products. Please
identify the distances and the nature of the weights that are allegedly used in the accused
products. Also, please identify how, if at all, such weighted distances are allegedly used to create
a "regional sum" in the accused products.

> Answer: This criticism appears to misconstrue Oplus' contention as referring to "values"
being measured, while the claim language refers to "weighted distances" which Vizio apparently
believes are to be measured. We respectfully disagree. The pertinent claim language is "…
whereby each said value of each said pixel inter-local neighborhood parameter represents a
regional sum of inter-local neighborhood weighted distances measured between said neighboring
pixels …" thus the language says the neighborhood parameter represents a sum measured
between neighboring pixels which are weighted by distances. Further, the calculating pertains to
"values of pixel inter-local neighborhood parameters" not to calculating pixel values or
distances, and further the method of calculating is not claimed, only the nature of those values.

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The regional sum is the measure of the randomness or lack of similarity of the pixels of the neighborhood and is center weighted, that is in 2D space the central differences which have small distances such as those differences between a pixel and its adjacent pixels in the neighborhood center contribute more to the sum than the outer differences such as those between the non-adjacent but surrounding pixels which have large distances. Accordingly Oplus contends that it need not further describe or identify the distances or the nature of the weights (e.g., specific coefficients) that are used. Rather, it is Oplus' contention that those of skill observing the accused products understand that there is a distance weighting which is necessary for a randomness measure in this 3:2 pulldown operation with noise reduction.

Vizio Letter at 8: While the patent does state that this parameter can be used to determine how to interpolate pixel data to arrive at values for missing pixels (the '840 Patent at 17:45-55), that does not mean that any method that uses interpolation to arrive at a missing value necessarily relies upon the calculation of a "virtual-pixel intra-local neighborhood parameter." The assumption that this element is met by any method that performs a "calculation . . . to determine what the proper value of a pixel affected by noise should be" is unsupported and unwarranted. Infringement Contentions, Exh. B at 14. We further note that Oplus has interpreted and applied this limitation inconsistently as between Faroudja DCDi and MediaTek MDDi products. Please identify the method by which this parameter is allegedly calculated in the accused products.

Answer: The calculation of the value of the virtual pixel intra-local neighborhood parameter is performed the same as for the previous pixel and next pixel as discussed with respect to element (c)(i), above, except that the value pertains to a virtual pixel instead of a real pixel. See the response to the point raised in page 7 of your letter, above. Further, any alleged inconsistencies between the MDDi and DCDi products claim charts are merely a result of different product assertions and capabilities, all of which fall within the scope of the claimed invention.

Vizio Letter at 8-9: While the counter may be used to assess the influence of noise on particular pixel values, it does not follow that any method which assesses the influence of noise necessarily involves making adjustments to a pixel entropy counter. Please identify how the "adjusting" step is allegedly carried out in the accused products and the nature of the alleged "pixel entropy counter."

Answer: Vizio complains about the Oplus contention with respect to step (c)(iii) and (c)(iv) but misunderstands the claim language and the contention provided by Oplus. This element entails recognizing an editing created error which causes one or more pixels to be in error, that is noisy, otherwise as being highly random, otherwise having high entropy, whether it is a real or a virtual pixel, and in particular whether the time sequential fields and the pixels therein are properly related. Vizio's question seeks information about how the counters are adjusted, but these details are not claim elements and are not Oplus' burden.

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What is important is that the claim step is met. That is, that the entropy counter of a given pixel is adjusted and thus the counter reflects a measure of how random each pixel is, i.e. it reflects its entropy. Even beyond the documentation supplied in Oplus' preliminary infringement contentions, that step is known to exist in the accused Vizio product products because the 3:2 pulldown operation for 3D noise reduction excludes high entropy pixels, which can be verified by those of skill observing the operation of Vizio product on a video image which is acquired from a film source.

It is further noted that Vizio mischaracterizes the claim language of (c)(iv) when it states "While an entropy value may be used to calculate new values of pixels affected by noise …" when in actuality this claim element states "whereby said values of the entropy … are used for automatically deciding, … not to use values selected from the group … for assigning a real value to said virtual pixel in said current field …" Col. 26, ll. 1-12. To the contrary, the entropy value is used to ensure a high entropy pixel is not used in a value selected to be used for the virtual pixel in the current field.

Vizio further complains that no specific entropy calculations are identified, however the claim element does not call for a specific entropy calculation, rather it simply calls for "calculating a value of the entropy." By way of example, that value which is calculated could be as simple as a single digital bit signifying 1 for high entropy or 0 for low entropy. That at least that value is calculated is demonstrated by the fact that high entropy pixels are prevented from being included in the assignment of a real value to the virtual pixel in the current field thus correcting an error (i.e. pixels of different images being in the previous or next field as compared to the current field) which is produced during real time editing. In other words, 3:2 pulldown correction and motion adaption is utilized.

Vizio Letter at 9: Please identify the specific entropy calculations that Oplus contends are carried out by the accused products for each of the referenced pixels.

Answer: We respectfully disagree with your characterization of claim element (c)(iv) in stating that "[w]hile an entropy value may be used to calculate new values of pixels affected by noise …." In actuality, this claim element states "whereby said values of the entropy … are used for automatically deciding, … not to use values selected from the group … for assigning a real value to said virtual pixel in said current field …" Col. 26, ll. 1-12. That is, the entropy value is used to ensure a high entropy pixel is not used in a value selected to be used for the virtual pixel in the current field.

While Vizio complains that no specific entropy calculations are identified, Oplus submits that the claim element does not call for a specific entropy calculation, rather it simply calls for "calculating a value of the entropy." By way of example, that value which is calculated could be as simple as a single digital bit signifying 1 for high entropy or 0 for low entropy. That at least that value is calculated is demonstrated by the fact that high entropy pixels are prevented from being included in the assignment of a real value to the virtual pixel in the current field, thus

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correcting an error (i.e. pixels of different images being in the previous or next field as compared to the current field) which is produced during real time editing.

Vizio Letter at 9: Oplus references "TrueLife Enhancement" and "Cross Color Suppression" technologies in its allegations concerning step (c)(iv). Please state the basis for Oplus' assertion that these technologies are used in the accused products, as well as the basis for its assertion that they "are based on temporal filtering." Infringement Contentions, Exh. B at 18. Please also explain how it is the use of such technologies evidences the calculating of entropies called for by this limitation.

Answer: These are additional features of DCDi Cinema, which is found in the FLI 8532 Cortez used by Vizio, as detailed above. See, e.g., http://www.faroudja.com/faroudja/brands/dcdi-cinema.jsp , discussing TrueLife as a component of DCDi Cinema. Faroudja describes these features as being based upon temporal filtering, e.g.: "Faroudja's Cross Color Suppression uses the motion detector to selectively perform the temporal filtering only where there is no motion in the image and to use the already existing frame memory for the chroma storage required." The person of ordinary skill in the art would know that cross color is an artifact which is present in NTSC video signals, i.e. interlaced video signals. It would also be known that the "existing frame memory" is that utilized for several features of the DCDi Cinema including noise reduction and deinterlacing and that the motion detector is utilized in conjunction with the frame memory of video. "Even cross-color that has been encoded onto a DVD recorded from a composite source can be suppressed using this technology." http://www.3dsi.co.za/Techno%20Speak/Faroudja/Pages/Faroudja.htm. These are believed to detect and filter content changes based upon randomness over a series of fields or frames in a manner similar to that described with respect to the 3D adaptive noise reduction described above.

Vizio Letter at 10: Does Oplus contend that any method which performs deinterlacing on an interlaced field subjected to 3:2 pulldown necessarily involves a determination of pixel entropy? If so, please state the basis for this contention.

Answer: No, Oplus does not so contend that any method which performs deinterlacing on an interlaced field subjected to 3:2 pulldown necessarily involves a determination of pixel entropy. Rather, Oplus has contended, as reflected in its Preliminary Infringement contentions, that Vizio televisions using MDDi on video subject to 3:2 pulldown meet the asserted claims of the '840 patent.

Vizio Letter at 10: Oplus further states that "Interlaced video signals are subject to errors caused by real time editing of the video signal." Infringement Contentions, Exh. D at 1. Please identify any such errors that have occurred or which have allegedly been corrected by the accused products.

Answer: An example of the errors which are referred to are cadence errors, which are well known by the person of ordinary skill in the art. Cadence errors are temporal errors,

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relating to errors, or noise in pixels in the sequential fields being received. Entropy is a measure of randomness, or stated another way a measure of the absence of similarity and lack of similarity in a given image is most frequently due to motion, detail or noise. Cadence errors produce a lack of similarity in sequential fields of the same image. Thus the comparison to detect noise as practiced by the accused products determines the entropy of the pixels

Vizio Letter at 10:   The only support that Oplus cites for this proposition is U.S. Patent No. 7,286,186. However, Oplus fails to provide any basis for its implicit contention that the accused products practice this patent. Please provide Oplus' basis for this assertion. Moreover, the '186 Patent does not concern entropy or noise calculations or 3:2 pull down. Please explain what the relevance of the patent is to the asserted claims.

Answer: As indicated above, we relied upon analysis provided by our consulting experts in identifying this patent as being one which is believed to be practiced by Mediatek in the accused Vizio televisions using MDDi motion adaptive deinterlacing technology (though this are not the only such patent believed to be used by Mediatek). Also, as reflected in the preliminary infringement contentions, this is believed to show evidence of the ability to receive and characterize the streaming digital video input signal.

Vizio Letter at 10:   It further appears that Oplus contends-- without any support--that steps (c)(i) to (c)(iv) are necessarily performed in any method of performing 3:2 deinterlacing. Please confirm whether that is, in fact, what Oplus contends and provide support for this contention.

Answer: No – the steps of claim elements (c)(i) to (c)(iv) are not necessarily performed in "any" method of performing 3:2 deinterlacing, but they are necessarily performed in the accused Vizio products using MDDi with 3:2 pulldown. That step is known to exist in the Vizio product because the 3:2 pulldown, and in particular with respect to the claim of MDDI 2:2 pulldown operation, for both noise reduction and deinterlacing excludes high entropy pixels, which can be verified by observing the operation of Vizio product on a video image which is acquired from a film source. Such observation however is unnecessary because the person of ordinary skill in the art will know from the various supplied documentation describing the operation of the MDDi IC, and in particular those Vizio descriptions pointed to by Oplus in its preliminary infringement contentions, that this is taking place.

Vizio Letter at 11: Oplus fails to explain what the alleged "sum" is or how "distances" are used to weight it. Please clarify how the accused products allegedly calculate the claimed values such that they represent a regional sum of local neighborhood weighted distances. Further, Oplus asserts, without any support, that "MDDi *must determine* the neighborhood parameters of each previous and next pixel neighborhoods from the previous and next fields in order to know or estimate which of the pixels are obtained from or belong to the same input image frame . . . ." Infringement Contentions, Exh. D at 3. Please provide the basis for this statement.

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      Answer: This criticism appears to misconstrue Oplus' contention as referring to "values" being measured, while the claim language refers to "weighted distances" which Vizio apparently believes are to be measured. We respectfully disagree. The pertinent claim language is "… whereby each said value of each said pixel inter-local neighborhood parameter represents a regional sum of inter-local neighborhood weighted distances measured between said neighboring pixels …" thus the language says the neighborhood parameter represents a sum measured between neighboring pixels which are weighted by distances. Further, the calculating pertains to "values of pixel inter-local neighborhood parameters" not to calculating pixel values or distances, and further the method of calculating is not claimed, only the nature of those values. The regional sum is the measure of the randomness or lack of similarity of the pixels of the neighborhood and is center weighted, that is in 2D space the central differences which have small distances such as those differences between a pixel and its adjacent pixels in the neighborhood center contribute more to the sum than the outer differences such as those between the non-adjacent but surrounding pixels which have large distances. Accordingly Oplus contends that it need not further describe or identify the distances or the nature of the weights (e.g., specific coefficients) that are used. Rather, it is Oplus' contention that those of skill observing the accused products understand that there is a distance weighting which is necessary for a randomness measure in this 3:2 pulldown operation with noise reduction.

      Vizio Letter at 11: Oplus provides no support for its assertion that this limitation is practiced by the accused products, instead asserting that it "must" occur "[i]n order to perform 3:2 deinterlacing . . . ." Infringement Contentions, Exh. D at 4. Please explain how the accused products allegedly calculate a value of the claimed parameter and identify Oplus' basis for such allegations.

      Answer: The calculation of the value of the virtual pixel intra-local neighborhood parameter is performed the same as for the previous pixel and next pixel as discussed with respect to element (c)(i), above, except that the value pertains to a virtual pixel instead of a real pixel. See the response to the point raised in page 7 of your letter, above.

      Vizio Letter at 11: Please explain the basis for Oplus' assertion that MDDi determines or estimates which adjacent field pixel is most closely related to the virtual pixel. Please also explain how it is that such a determination or estimate *necessarily* involves the use of a "pixel entropy counter" and identify the calculations allegedly performed by the accused products which Oplus contends constitute the counter.

      Answer: Vizio complains about the Oplus contention with respect to sub step (c)(iii) but misunderstands the claim language and the contention provided by Oplus. This step entails recognizing an editing created error which causes one or more pixels to be in error, that is noisy, otherwise as being highly random, otherwise having high entropy, whether it is a real or a virtual pixel, and in particular whether the time sequential fields and the pixels therein are properly related. That is, that the entropy counter of a given pixel is adjusted and thus the counter reflects a measure of how random each pixel is, i.e. it reflects its entropy. Even beyond the documentation supplied in Oplus' preliminary infringement contentions, that step is known to

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exist in the accused Vizio product products because the 3:2 pulldown operation for 3D noise reduction excludes high entropy pixels, which can be verified by those of skill observing the operation of Vizio product on a video image which is acquired from a film source.

    <u>Vizio Letter at 12</u>: Please identify the specific entropy calculations that Oplus contends are carried out by the accused products for each of the referenced pixels.

    <u>Answer</u>: Oplus submits that the claim element does not call for a specific entropy calculation, rather it simply calls for "calculating a value of the entropy." By way of example, that value which is calculated could be as simple as a single digital bit signifying 1 for high entropy or 0 for low entropy. That at least that value is calculated is demonstrated by the fact that high entropy pixels are prevented from being included in the assignment of a real value to the virtual pixel in the current field, thus correcting an error (i.e. pixels of different images being in the previous or next field as compared to the current field) which is produced during real time editing.

    This should address all of the points raised in your letter.

        Very truly yours,

        Arthur A. Gasey

AAG/mk

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15 *Attorneys for Defendant*
VIZIO, Inc.
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17   UNITED STATES DISTRICT COURT

18   CENTRAL DISTRICT OF CALIFORNIA

19   WESTERN DIVISION

20 OPLUS TECHNOLOGIES, LTD.,	CASE NO.: CV12-5707 MRP (E)
21 Plaintiff,	Hon. Mariana R. Pfaelzer
22 v.	
23 SEARS HOLDINGS CORPORATION, VIZIO, INC.,	**DEFENDANT VIZIO INC.'S SUPPLEMENTAL OBJECTIONS AND RESPONSES TO PLAINTIFF OPLUS TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES (NOS. 1, 4, 7, 11, AND 12)**
24 Defendants.	
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DEFENDANT VIZIO INC.'S SUPPLEMENTAL OBJECTIONS AND RESPONSES TO PLAINTIFF OPLUS
TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES

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(vertical, left margin) Glaser Weil Fink Jacobs Howard Avchen & Shapiro LLP

1   10.   VIZIO's responses are based upon information presently known to

2 VIZIO. As VIZIO has not yet completed its investigation of the facts relating to this

3 action, and has not yet reviewed all materials relating to this action, interviewed all

4 witnesses in this action, and has not yet completed its preparation for trial, VIZIO

5 reserves the right to amend and/or supplement its responses to these Interrogatories if

6 and when additional facts or documents are discovered. Additionally, because

7 VIZIO's responses are based on facts and documents that VIZIO has indentified to

8 date, they do not preclude VIZIO from later relying on facts or documents discovered

9 or generated pursuant to subsequent investigation or discovery.   VIZIO's partial

10 response to any Interrogatory is not to be construed as a waiver of any of its rights to

11 object to any other Interrogatory.

12   **SPECIFIC RESPONSES AND OBJECTIONS**

13 **AMENDED INTERROGATORY NO. 1:**

14   Identify all Relevant Products by product number, trade name, and/or other

15 designation.

16 **SUPPLEMENTAL RESPONSE TO AMENDED INTERROGATORY NO. 1:**

17   VIZIO incorporates by reference each of the foregoing General Objections.

18   VIZIO further objects to this Interrogatory on the grounds that this

19 Interrogatory seeks information that is not relevant to this action or likely to lead to

20 the discovery of admissible evidence. VIZIO further objects to the extent this

21 Interrogatory seeks information that is publicly available, and hence equally available

22 to all parties to this litigation.

23   Subject to and without waiver of the foregoing general and specific objections,

24 VIZIO responds as follows:

25   VIZIO agreed to produce non-privileged documents responsive to this request

26 to the extent they exist and have not been produced, pursuant to Fed. R. Civ. P. 33(d).

27 Pursuant to the Court's April 3, 2013 Order, VIZIO is not obligated to provide

28 discovery pertaining to "Relevant Products" as defined by Oplus unless and until it

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1 provides adequate infringement contentions. As to the specifically identified

2 television products identified in Oplus' August 9, 2012 Infringement Contentions,

3 VIZIO has conducted a reasonable search and determined that none of them were on

4 sale after the filing of Oplus' Complaint. Thus, no non-privileged, relevant

5 documents responsive to this Interrogatory concerning the televisions specifically

6 identified by Oplus in its Infringement Contentions exist. VIZIO products that were

7 on sale prior to Oplus' filing of its Complaint on December 1, 2011 are irrelevant to

8 this case, as detailed below, as VIZIO had no notice of the asserted patents prior to

9 the filing of Oplus' Complaint on December 1, 2011.

10   Oplus has no viable claim against VIZIO for direct infringement and states

11 none. In its August 9, 2012 Infringement Contentions, Oplus asserted that "Vizio has

12 (a) directly infringed and continues to directly infringe claims 7, 8, 9, 14 and 15 of the

13 '842 patent, claims 56, 57, 58, 59, and 62 of the '840 patent within the meaning of 35

14 U.S.C. §271(a) . . ." However, Oplus has not alleged any act by VIZIO that could

15 constitute direct infringement.

16   Instead, each of the claims asserted by Oplus is a method claim. A method

17 claim cannot be directly infringed through the selling, offering to sell, importing or

18 making of a product merely *capable* of practicing a method. *See Ricoh Co., Ltd. v.*

19 *Quanta Computer Inc.*, 550 F. 3d 1325, 1335 (Fed. Cir. 2008) ("Accordingly, we hold

20 that a party that sells or offers to sell software containing instructions to perform a

21 patented method does not infringe the patent under § 271(a)."); *NTP, Inc. v. Research*

22 *In Motion, Ltd.*, 418 F.3d 1282, 1320-21 (Fed. Cir. 2005) ("Thus, the legislative

23 history of section 271(a) indicates Congress's understanding that method claims could

24 only be directly infringed by use …. The legislative history cited with respect to the

25 sell and offer to sell provisions indicates that Congress did not consider the 'import'

26 prong of section 271(a) to apply to method claims."); *Joy Techs., Inc. v. Flakt, Inc.,* 6

27 F.3d 770, 773 (Fed. Cir. 1993) ("The law is unequivocal that the sale of equipment to

28 perform a process is not a sale of the process within the meaning of section 271(a).");

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1 *id.* at 774-75 ("[A] method claim is not directly infringed by the sale of an apparatus

2 even though it is capable of performing only the patented method. The sale of the

3 apparatus is not a sale of the method. A method claim is directly infringed only by

4 one practicing the patented method.").

5   As VIZIO only sells products that Oplus alleges are capable of being used to

6 practice the methods of the asserted patents, VIZIO cannot directly infringe the

7 asserted claims of the asserted patents.

8   In its August 9, 2012 Infringement Contentions, Oplus also asserted that "Vizio

9 has . . . (b) indirectly infringed and continues to indirectly infringe the same asserted

10 claims of the patents-in-suit under 35 U.S.C. 35 U.S.C. §271(b) by knowingly and

11 actively inducing infringement by others of those claims; and (c) further indirectly

12 infringed and continues to directly infringe the same claims of the patents-in-suit

13 under 35 U.S.C. 35 U.S.C. §271(c) by contributing to the infringement of others."

14   Products sold prior to the filing of Oplus' Complaint are irrelevant to Oplus'

15 indirect infringement claims, as Oplus has not established any notice of the asserted

16 patents prior to the filing of its Complaint. And VIZIO had no such notice. Both

17 contributory infringement and inducement of infringement require, at a minimum,

18 actual knowledge of the patents that are allegedly infringed. *Synqor, Inc. v. Artesyn*

19 *Techs., Inc.,* 709 F.3d 1365 (Fed. Cir. 2013) (citing *Global-Tech Appliances, Inc. v.*

20 *SEB S.A.,* 131 S. Ct. 2060, 2068, 179 L. Ed. 2d 1167 (2011)) ("Liability for induced

21 or contributory infringement under § 271(b) or (c) requires 'knowledge that the

22 induced acts constitute patent infringement.' This includes, in part, actual

23 'knowledge of the existence of the patent that is infringed.'").

24 **AMENDED INTERROGATORY NO. 3:**

25   State and describe in detail the complete factual basis for Vizio's Fourth

26 Affirmative Defense that "by reason or prior art and the proceedings in the United

27 States Patent and Trademark Office during the prosecution of the applications, and all

28 applications to which the '842 or '840 Patents claim priority, that led to the issuance

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Respectfully submitted,

By: /s/ Charles C. Koole

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A002251

AO 88B (Rev. 06/09) Subpoena to Produce Documents, Information, or Objects or to Permit Inspection of Premises in a Civil Action

UNITED STATES DISTRICT COURT
for the

Northern District of Illinois

Oplus Technologies, Ltd.	)
Plaintiff	)
v.	)
Sears Holdings Corporation	)
and Vizio, Inc.	)
Defendant	)

Civil Action No.   CV12-5707

(If the action is pending in another district, state where:

Central District of California   )

SUBPOENA TO PRODUCE DOCUMENTS, INFORMATION, OR OBJECTS
OR TO PERMIT INSPECTION OF PREMISES IN A CIVIL ACTION

To: Technology Licensing Corp., 711 South Carson Street, Ste 6, Carson City, NV

☑ *Production:* **YOU ARE COMMANDED** to produce at the time, date, and place set forth below the following documents, electronically stored information, or objects, and permit their inspection, copying, testing, or sampling of the material: See Exhibit A

Place: Niro, Haller & Niro, 181 W. Madison, Ste. 4600, Chicago, IL 60602	Date and Time: 05/08/2013 9:00 am

☐ *Inspection of Premises:* **YOU ARE COMMANDED** to permit entry onto the designated premises, land, or other property possessed or controlled by you at the time, date, and location set forth below, so that the requesting party may inspect, measure, survey, photograph, test, or sample the property or any designated object or operation on it.

Place:	Date and Time:

The provisions of Fed. R. Civ. P. 45(c), relating to your protection as a person subject to a subpoena, and Rule 45 (d) and (e), relating to your duty to respond to this subpoena and the potential consequences of not doing so, are attached.

Date: 05/03/2013

CLERK OF COURT	
	OR
_____	/s/ Arthur A. Gasey _____
Signature of Clerk or Deputy Clerk	*Attorney's signature*

The name, address, e-mail, and telephone number of the attorney representing *(name of party)*   Oplus Technologies, Ltd.
_____, who issues or requests this subpoena, are:

Arthur A. Gasey, Niro, Haller & Niro, 181 W. Madison, Ste. 4600, Chicago, IL 60602.

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Civil Action No. CV12-5707

PROOF OF SERVICE

(This section should not be filed with the court unless required by Fed. R. Civ. P. 45.)

This subpoena for *(name of individual and title, if any)* _____

was received by me on *(date)* _____ .

❐ I served the subpoena by delivering a copy to the named person as follows: _____

_____

_____   on *(date)* _____ ; or

❐ I returned the subpoena unexecuted because: _____

_____ .

Unless the subpoena was issued on behalf of the United States, or one of its officers or agents, I have also tendered to the witness fees for one day's attendance, and the mileage allowed by law, in the amount of

$ _____ .

My fees are $ _____ for travel and $ _____ for services, for a total of $ 0.00   .

I declare under penalty of perjury that this information is true.

Date: _____

_____
Server's signature

_____
Printed name and title

_____
Server's address

Additional information regarding attempted service, etc:

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Federal Rule of Civil Procedure 45 (c), (d), and (e) (Effective 12/1/07)

(c) Protecting a Person Subject to a Subpoena.

 (1) *Avoiding Undue Burden or Expense; Sanctions.* A party or attorney responsible for issuing and serving a subpoena must take reasonable steps to avoid imposing undue burden or expense on a person subject to the subpoena. The issuing court must enforce this duty and impose an appropriate sanction — which may include lost earnings and reasonable attorney's fees — on a party or attorney who fails to comply.

 (2) *Command to Produce Materials or Permit Inspection.*

 (A) *Appearance Not Required.* A person commanded to produce documents, electronically stored information, or tangible things, or to permit the inspection of premises, need not appear in person at the place of production or inspection unless also commanded to appear for a deposition, hearing, or trial.

 (B) *Objections.* A person commanded to produce documents or tangible things or to permit inspection may serve on the party or attorney designated in the subpoena a written objection to inspecting, copying, testing or sampling any or all of the materials or to inspecting the premises — or to producing electronically stored information in the form or forms requested. The objection must be served before the earlier of the time specified for compliance or 14 days after the subpoena is served. If an objection is made, the following rules apply:

 (i) At any time, on notice to the commanded person, the serving party may move the issuing court for an order compelling production or inspection.

 (ii) These acts may be required only as directed in the order, and the order must protect a person who is neither a party nor a party's officer from significant expense resulting from compliance.

 (3) *Quashing or Modifying a Subpoena.*

 (A) *When Required.* On timely motion, the issuing court must quash or modify a subpoena that:

 (i) fails to allow a reasonable time to comply;

 (ii) requires a person who is neither a party nor a party's officer to travel more than 100 miles from where that person resides, is employed, or regularly transacts business in person — except that, subject to Rule 45(c)(3)(B)(iii), the person may be commanded to attend a trial by traveling from any such place within the state where the trial is held;

 (iii) requires disclosure of privileged or other protected matter, if no exception or waiver applies; or

 (iv) subjects a person to undue burden.

 (B) *When Permitted.* To protect a person subject to or affected by a subpoena, the issuing court may, on motion, quash or modify the subpoena if it requires:

 (i) disclosing a trade secret or other confidential research, development, or commercial information;

 (ii) disclosing an unretained expert's opinion or information that does not describe specific occurrences in dispute and results from the expert's study that was not requested by a party; or

 (iii) a person who is neither a party nor a party's officer to incur substantial expense to travel more than 100 miles to attend trial.

 (C) *Specifying Conditions as an Alternative.* In the circumstances described in Rule 45(c)(3)(B), the court may, instead of quashing or modifying a subpoena, order appearance or production under specified conditions if the serving party:

 (i) shows a substantial need for the testimony or material that cannot be otherwise met without undue hardship; and

 (ii) ensures that the subpoenaed person will be reasonably compensated.

(d) Duties in Responding to a Subpoena.

 (1) *Producing Documents or Electronically Stored Information.* These procedures apply to producing documents or electronically stored information:

 (A) *Documents.* A person responding to a subpoena to produce documents must produce them as they are kept in the ordinary course of business or must organize and label them to correspond to the categories in the demand.

 (B) *Form for Producing Electronically Stored Information Not Specified.* If a subpoena does not specify a form for producing electronically stored information, the person responding must produce it in a form or forms in which it is ordinarily maintained or in a reasonably usable form or forms.

 (C) *Electronically Stored Information Produced in Only One Form.* The person responding need not produce the same electronically stored information in more than one form.

 (D) *Inaccessible Electronically Stored Information.* The person responding need not provide discovery of electronically stored information from sources that the person identifies as not reasonably accessible because of undue burden or cost. On motion to compel discovery or for a protective order, the person responding must show that the information is not reasonably accessible because of undue burden or cost. If that showing is made, the court may nonetheless order discovery from such sources if the requesting party shows good cause, considering the limitations of Rule 26(b)(2)(C). The court may specify conditions for the discovery.

 (2) *Claiming Privilege or Protection.*

 (A) *Information Withheld.* A person withholding subpoenaed information under a claim that it is privileged or subject to protection as trial-preparation material must:

 (i) expressly make the claim; and

 (ii) describe the nature of the withheld documents, communications, or tangible things in a manner that, without revealing information itself privileged or protected, will enable the parties to assess the claim.

 (B) *Information Produced.* If information produced in response to a subpoena is subject to a claim of privilege or of protection as trial-preparation material, the person making the claim may notify any party that received the information of the claim and the basis for it. After being notified, a party must promptly return, sequester, or destroy the specified information and any copies it has; must not use or disclose the information until the claim is resolved; must take reasonable steps to retrieve the information if the party disclosed it before being notified; and may promptly present the information to the court under seal for a determination of the claim. The person who produced the information must preserve the information until the claim is resolved.

(e) Contempt. The issuing court may hold in contempt a person who, having been served, fails without adequate excuse to obey the subpoena. A nonparty's failure to obey must be excused if the subpoena purports to require the nonparty to attend or produce at a place outside the limits of Rule 45(c)(3)(A)(ii).

Exhibit A

Pursuant to Fed. R. Civ. P. 45, Oplus Technologies, Ltd. ("Oplus") requests that Technology Licensing Corporation ("TLC") produce the documents and things described in the following requests. Oplus will examine the documents at the offices of Niro, Haller & Niro, 181 W. Madison St., Suite 4600, Chicago, IL 60602. By accepting photocopies, Oplus is not waiving its right to examine originals where necessary.

Where TLC withholds documents for reasons of attorney-client privilege, work-product immunity or the like, Oplus requests that it be served with a list of such documents prepared in accordance with applicable case law, including at least the names and titles or functions of the authors; any recipients; the date; the basis for withholding; and a description of the document and its subject matter sufficient to allow Oplus to contest the claim.

In cases where TLC believes there is no responsive document, Oplus asks that TLC produce the best available documents from which the information sought by the request may be derived. In the case of financial information, it is usually possible to derive the desired information if it is not already available.

These requests for production shall be deemed continuing so as to require the requested information as of the date of service of TLC's answers thereto and also as to require prompt supplementation whenever the conditions of Rule 26(e) of the Federal Rules of Civil Procedure are met.

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Definitions

"VIZIO" or "Defendant" mean VIZIO, Inc. and each predecessor business entity, whether incorporated or not, their officers, directors, employees, brokers, agents, attorneys, affiliates, parent corporations, holding companies, subsidiaries, franchisees, licensees, and successors, whether past or present, and all other persons who have acted or purport(ed) to act on their behalf.

"Oplus" or "Plaintiff" mean Oplus Technologies, Ltd.

"The action" means Oplus Technologies, Ltd. v. Sears Holding Corporation; Vizio, Inc. CV12-5707 (C.D. Cal).

"TLC" means Technology Licensing Corporation and each predecessor business entity, whether incorporated or not, their officers, directors, employees, brokers, agents, attorneys, affiliates, parent corporations, holding companies, subsidiaries, franchisees, licensees, and successors, whether past or present, and all other persons who have acted or purport(ed) to act on their behalf.

"DCDi" refers to Faroudja DCDi technology.

"HQV" refers to Qualcomm's HQV (Hollywood Quality Video) processing technology.

"MDDi" refers to MediaTek's MDDi motion adapative de-interlace technology.

"Document(s)" generally refers to anything which would be a "writing" or "recording" pursuant to Rule 1001(1) of the Federal Rules of Evidence or "document" or "electronically stored information" pursuant to Rule 34(a) of the Federal Rules of Civil Procedure. However, email and other electronic correspondence is not included within the term "document(s)" for the purposes of these requests.

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The terms "relate to," "relating to" or "related to" mean relevant to, referring to, alluding to, responding to, concerning, connected with, commenting on, in respect of, about, regarding, discussing, evidencing, showing, describing, reflecting, analyzing and/or constituting.

Document Requests

1. All Pleadings files, deposition files and accompanying exhibits retained by Outside Counsel pursuant to the Protective Order from the case styled Technology Licensing Corporation et al., v. Vizio, Inc., et al. (Civ. Action No. 1:08-cv-00393),   which identify or relate to the use of HQV, MDDi or DCDi technologies by Vizio.

H H N

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

IP INNOVATION LLC, and TECHNOLOGY
LICENSING CORPORATION,

Plaintiffs,

vs.

VIZIO, INC. (f/k/a V, Inc.) and MICROSOFT
CORPORATION,

Defendants.

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No. 08 C 393
Judge St. Eve
Magistrate Judge Cox

JURY TRIAL DEMANDED

STIPULATED PROTECTIVE ORDER

The discovery procedures in this case may require disclosure of information, either

documentary or testimonial or both, regarded by the producing party or non-party as confidential

information incorporating proprietary data, know-how, trade secrets, or other valuable

commercial information. Accordingly, the parties, by and through their respective attorneys,

stipulate and agree to the following terms and conditions, which shall apply to this civil action:

1.   Any document, tangible item, or testimonial information (including any document

or tangible thing as defined in Rule 34(a) of the Federal Rules of Civil Procedure or any

applicable local rule) that is provided, produced, disclosed, or filed in the above-captioned *IP*

Innovation LLC & Technology Licensing Corporation v. VIZIO, Inc. and Microsoft Corporation,

08-C-393 (N.D. Ill.), by or on behalf of any party or non-party, voluntarily or involuntarily,

whether pursuant to formal or informal discovery requests, subpoena, deposition notice, or

motion practice, and whether revealed in a document, deposition, a response to any type of

written discovery, a submission to the Court, or otherwise ("Litigation Material"), which that

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replacement pages bearing the appropriate confidentiality legend. In the event of any unintentional or inadvertent disclosure of CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information other than in a manner authorized by this Protective Order, counsel for the party responsible for the disclosure shall immediately notify opposing counsel of all of the pertinent facts, and make every effort to further prevent unauthorized disclosure including, retrieving all copies of the CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information from the recipient(s) thereof, and securing the agreement of the recipients not to further disseminate the CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information in any form. Compliance with the foregoing shall not prevent the producing party or non-party from seeking further relief from the Court.

23.   The restrictions set forth in this Order will not apply to information which is known to the receiving party or the public before the date of its transmission to the receiving party, or which becomes known to the public after the date of its transmission to the receiving party, provided that such information does not become publicly known by any act or omission of the receiving party, its employees, or agents which would be in violation of this order. If such public information is designated as CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY, the receiving party must inform the producing party or non-party of the pertinent circumstances before the restrictions of this order will be inapplicable.

24.   No person or party shall directly or indirectly utilize or disclose any CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE –

ATTORNEYS' EYES ONLY information obtained pursuant to pretrial discovery in this action,

except for the purposes of preparation, trial, and appeal of this action only and in accordance

with any further order issued by the Court. Nothing herein shall prevent or in any way limit

disclosure, use, or dissemination of any documents, things, or information that are in the public

domain.

25.   This Protective Order shall be without prejudice to the right of any party or non-

party to oppose production of any information on grounds other than confidentiality.

26.   This Protective Order shall not prevent any party or non-party from applying to

the Court for relief therefrom, or from applying to the Court for further or additional protective

orders, or from agreeing among themselves to modify or vacate this Protective Order, subject to

the approval of the Court.

27.   (a)   At the conclusion of this action, including any appeals, all

CONFIDENTIAL, ATTORNEYS' EYES ONLY, and CONFIDENTIAL SOURCE CODE –

ATTORNEYS' EYES ONLY information furnished pursuant to this Protective Order, and all

copies and summaries thereof and notes made therefrom, shall be returned to the producing

attorneys of record, or, at the producing party's or non-party's option, destroyed by counsel for

the receiving party, within sixty (60) days of the conclusion of this action. If the receiving party

destroys CONFIDENTIAL, ATTORNEYS' EYES ONLY, and CONFIDENTIAL SOURCE

CODE – ATTORNEYS' EYES ONLY information as provided in this paragraph, such party

must certify to the producing party or non-party in writing that it has made a reasonable and

good faith effort to destroy such CONFIDENTIAL, ATTORNEYS' EYES ONLY, and

CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information, and that all

such material has been destroyed to the best of its knowledge. The provisions of this Protective

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CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information shall be disclosed to the inventor unless the thirty- (30) day period expires without the producing party or non-party having filed a motion or without a Court Order authorizing such disclosure if the producing party or non-party has filed a motion for protection to prevent the disclosure of certain (or any) ATTORNEYS' EYES ONLY or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information to the inventor.

      (c)   In the event an inventor of any patent-in-suit is permitted access to any ATTORNEYS' EYES ONLY or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information pursuant to the procedures set forth in paragraph 36, such inventor must sign the form attached hereto as Appendix A.

      (d)   The parties' agreement to the process set forth in paragraph 36 will not be held against any party or non-party should a motion be filed pursuant to this paragraph given that the parties agreed to the process set forth herein to avoid involving the Court in the issue of inventor access to ATTORNEYS' EYES ONLY or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information until such time as there is an actual dispute on this issue.

      The foregoing is hereby stipulated by and between counsel.

      DATED this 12th day of December, 2008.

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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707 MRP (E)
Plaintiff,	*Honorable Mariana R. Pfaelzer*
v.	**OPLUS' RESPONSE TO VIZIO'S MOTION FOR PROTECTION**
SEARS HOLDINGS CORPORATION and VIZIO, INC.,	
Defendants.	

OPLUS' RESPONSE TO VIZIO'S MOTION FOR PROTECTION – CASE NO. CV 12-5707-MRP (E)

1   VIZIO legitimately believed that these infringement contentions were deficient, it

2   should have moved the Court to compel Oplus for a more definite statement of its

3   infringement contentions. Alternatively, rather than unilaterally refusing all

4   discovery, VIZIO should have moved the Court for an order for protection. It did

5   neither.

6   On April 10, 2013, shortly after entry of the Parties' Stipulated Protective

7   Order, Oplus produced 3,215 pages of documents and hoped (based on VIZIO's

8   prior representations) that VIZIO would do the same. VIZIO produced no

9   documents – despite demanding several changes and provisions to the proposed

10   Protective Order during negotiations that most recently spanned the period from

11   February 26, 2013 to April 3, 2013.

12   VIZIO then made clear that it read this Court's April 3, 2013 Order as

13   foreclosing **all** discovery, regardless of type and regardless of VIZIO's previous

14   representations. If VIZIO has properly interpreted this Court's Order, then its

15   issuance was certainly unexpected by Oplus and, therefore, has had sweeping

16   unintended and unforeseen consequences – the epitome of "rogue."

17   **IV.   OPLUS HAS NOT, AND NEVER INTENDED TO, VIOLATE THIS
           COURT'S ORDER**
18

19   VIZIO claims Oplus' counsel announced its intent to ignore the Court's

20   April 3, 2013 Order by calling it a "rogue order" – unexpected with unforeseen

21   consequences – and that Oplus subsequently issued a subpoena seeking discovery

22   from TLC. (VIZIO Br. at 4). There is no relationship between the Order and the

23   subpoena except that VIZIO contends that this Court's Order bars **all** discovery.

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OPLUS' RESPONSE TO VIZIO'S MOTION FOR PROTECTION – CASE NO. CV 12-5707-MRP (E)

1   On or about April 19, 2013, counsel for Oplus participated in a telephonic

2 meet and confer with counsel for VIZIO. (Opatken Decl., ¶ 2). The purpose of the

3 call was to discuss VIZIO's continued refusal to produce documents (numerous of

4 which had been identified by VIZIO as withheld until the entry of a Protective

5 Order). (Id.). On April 5, 2013, the Protective Order was entered. (Id.). While

6 VIZIO had previously said that the entry of a Protective Order was the only

7 remaining barrier to production of documents responsive to numerous requests,

8 VIZIO's counsel stated during the call that it was relying upon this Court's April 3,

9 2013 Order as justification for its refusal to provide *any* discovery. (Id. at ¶ 3).

10   VIZIO remained adamant that it would not produce documents, even those

11 unrelated to infringement and, thus, not framed solely by Oplus' infringement

12 contentions. (Id. at ¶ 10). By way of example, VIZIO refused to produce

13 documents relating to RPD No. 11 ("Documents sufficient to show the date

14 Defendant first learned of the existence of Oplus"), RPD No. 43 ("All validity or

15 patentability prior art search or investigation reports relied upon, reviewed,

16 generated, performed, commissioned, ordered, requested, received, contracted or

17 purchased by or for Defendant in reference to the patents-in-suit"), RPD No. 47

18 ("All documents and things that relate to correspondence and/or communication

19 among and between the Defendant and any third party, including, but not limited to

20 Sears Holding Corporation, JVC Americas Corporation, Faroudja Labs,

21 STMicroelectronics, Genesys Microchip, Silicon Optix, IDT, Teranex, Jupiter

22 Systems, GEO Semiconductor, MediaTek, AmTran Technology and VIZIO, Inc.,

23 mentioning or referring to Oplus, this lawsuit, or the patents-in-suit"), and RPD

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1   No. 52 ("All documents and things that relate to any of Defendant's document

2   retention and/or destruction policies and/or practices from 2006 to the present").

3   (Id. at ¶ 12). In short, VIZIO has imposed a stay of all discovery from it.

4   **V.   THE TLC PROTECTIVE ORDER**

5   VIZIO contends that "[u]nder the terms of the TLC Protective Order, VIZIO

6   is required to seek 'judicial protection from the enforcement of the subpoena'

7   and/or 'entry of an appropriate protective order' from *this Court* within fourteen

8   calendar days of notice of the subpoena from TLC counsel." (VIZIO Br. at 4

9   (emphasis added)). Not so.

10   Paragraph 27(c) of the Protective Order states that the United States District

11 Court for the Northern District of Illinois, not this Court, retains jurisdiction over

12 disputes arising under the TLC Protective Order:

13   For the purposes of enforcing this Protective Order and resolving any
        disputes thereunder, **the Court retains jurisdiction indefinitely** over
14   the parties and any persons provided access to CONFIDENTIAL,
        ATTORNEYS' EYES ONLY, and CONFIDENTIAL SOURCE
15   CODE – ATTORNEYS' EYES ONLY information under the terms
        of this Protective Order.

16

17 (Koole Decl. Ex. B, ¶ 27(c) (emphasis added)).

18   Likewise, VIZIO omits reference to Paragraph 33, which states:

19   All persons bound by this Protective Order are hereby notified that **if
        this Protective Order is in any manner violated, the person or**
20   **entity who commits such violation shall be subject to such**
        sanctions as the Court on motion and after a hearing deems just.

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22 (Id. at ¶ 33 (emphasis added)).

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OPLUS' RESPONSE TO VIZIO'S MOTION FOR PROTECTION – CASE NO. CV 12-5707-MRP (E)

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1   If VIZIO sincerely believed (as it now represents) that Oplus has violated or

2   is in imminent risk of violating the TLC Protective Order, then why would VIZIO

3   bring its motion in this Court? VIZIO claims that "**Through its prior**

4   **representation of TLC against VIZIO**, Oplus counsel was necessarily aware that

5   the protected information it possessed concerned the same three technologies" at

6   dispute in this case, (VIZIO Br. at 6 (emphasis added)); that "Oplus counsel used

7   the knowledge of VIZIO's confidential information **obtained from their prior**

8   **representation of TLC** in the prior action to subpoena documents," (Id. (emphasis

9   added)); and, that "**Oplus counsel necessarily used and relied on VIZIO's**

10   **protected information from the TLC case** in deciding to issue the Subpoena,"

11   (Id. at 6-7 (emphasis added)). The TLC litigation was not conducted in total

12   secrecy – the public record identifies the parties and the issues – and one need not

13   have access to confidential documents to realize that VIZIO produced documents

14   to TLC that relate to the same products and same technology at issue in this case.

15   Plaintiffs' Memorandum in Support of its Motion to Compel Defendant

16   VIZIO to Supplement its Responses to Plaintiffs' Interrogatories is a *public filing*

17   from *IP Innovation LLC et al. v. Mitsubishi Elec. Corp. et al.*, No. 1:08-cv-00393

18   (N.D. Ill.), wherein the plaintiff sought, publicly, to compel production of the

19   following:

20   Interrogatory No. 8: Identify by model number all products sold by
         Vizio since 2003 which includes resolution enhancement technology,
21   a controller chip which performs resolution enhancement, smoothing
         or interpolation, including, without limitation, devices using **HQV or**
22   **DCDi technologies** or any variants thereof, and further including
         those products set forth herein as Relevant Products.
23

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1   (Ferri Decl., ¶ 5; Ex. 3, p. 4 (emphasis added)).

2   Similarly, Plaintiff's Supplemental Responses to Defendant VIZIO's First

3   Set of Interrogatories (Nos. 2, 3, and 4) is a **public filing attached by VIZIO** to its

4   Motion to Compel Supplemental Responses to Interrogatory No. 4 in *IP*

5   *Innovation*, No. 1:08-cv-00393. That document includes the following:

6   Vizio also sells televisions with **HQV technology** to provide an image
        with increased resolution. Visio's [*sic*] **VP505XVT**, **VP504F**, and
7   **VP605** all have **HQV processing** built into the television panels.
        HQV processing is a video chip that delivers excellent video quality
8   for scaling lower-resolution sources to the native (i.e. increased)
        resolution of the panel. See "Vizio Unveils Plasmas With Built-In
9   **HQV**," January 6, 2008: http://ces.cnet.com/8301-13855_1-
        9841385.html....

10

11   (Ferri Decl., ¶ 6; Ex. 4, p. 9 (emphasis added)).

12   Likewise, VIZIO's Memorandum in Support of Motion for Summary

13   Judgment of Non-Infringement (#3) of United States Patent Nos. 6,870,964 and

14   7,382,929 is a **public filing by VIZIO** in *IP Innovation*, No. 1:08-cv-00393 that

15   states:

16   In this case, Plaintiff's Infringement Contentions assert that VIZIO
        products infringe the two Patents-in-Suit simply by incorporating any
17   one of three motion-adaptive "deinterlacing" technologies: **MDDi**
        (MediaTek chips); **HQV** (Teranex Reon chips); or **DCDI** (Genesis
18   chips).

19   (Ferri Decl., ¶ 7; Ex. 5, p. 18 (emphasis added)). VIZIO states in that same filing,

20   contrary to VIZIO's numerous assertions in this case, that "[d]uring discovery in

21   this action, in good faith, VIZIO identified (by make and model) the third party

22   chips used in its products." (Id. at p. 15).

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     _____
     OPLUS' RESPONSE TO VIZIO'S MOTION FOR PROTECTION – CASE NO. CV 12-5707-MRP (E)

The TLC Protective Order does not bar the use of publicly filed information; indeed, paragraphs 23 and 24 of the TLC Protective Order make clear that such a position would be untenable:

> 23. **The restrictions set forth in this Order will not apply to information** which is known to the receiving party or the public before the date of its transmission to the receiving party, or **which becomes known to the public after the date of its transmission** to the receiving party, provided that such information does not become publicly known by any act or omission of the receiving party, its employees, or agents which would be in violation of this order.
>
> * * * *
>
> 24. No person or party shall directly or indirectly utilize or disclose any CONFIDENTIAL, ATTORNEYS' EYES ONLY, or CONFIDENTIAL SOURCE CODE – ATTORNEYS' EYES ONLY information obtained pursuant to pretrial discovery in this action, except for the purposes of preparation, trial, and appeal of this action only and in accordance with any further order issued by the Court. **Nothing herein shall prevent or in any way limit disclosure, use, or dissemination of any documents, things, or information that are in the public domain.**

(Koole Decl. Ex. B, pp. 18-19 (emphasis added)).

In short, there has been no violation or imminent violation of the TLC Protective Order. And if there were (which is not the case), VIZIO should have sought relief in the Northern District of Illinois, not before this Court.

VI.   OPLUS' SUBPOENA PROPERLY SEEKS RELEVANT EVIDENCE

VIZIO has never moved this Court for an order foreclosing or staying all discovery by Oplus. And, the Court's April 3, 2013 Order denying Oplus' Motion to Compel did not foreclose all discovery by Oplus in this litigation.

In support of its position that Oplus seeks irrelevant information via subpoena, VIZIO argues that "Oplus has no viable claim against VIZIO for direct

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1   infringement because Oplus has not alleged any act by VIZIO of direct

2   infringement." (VIZIO Br. at 7-8). But this ignores Oplus' specific allegations that:

3   Vizio has used its accused products as testified by its corporate
         designees (see, e.g., the deposition of Mr. Lowe). See Also publicly
4   available examples of Vizio's use of the accused televisions through
         displays provided at its suite at CES and other shows (see, e.g.,
5   http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; see also
         http://www.businesswire.com/news/home/20080107005370/en/Eleve
6   n-Products-CES-2008-Feature-Silicon-Optix).

7   (Ferri Decl., ¶ 4; Ex. 2, p. 2).

8   VIZIO's refusal to produce any documents is simply an effort to shield

9   evidence of direct infringement. VIZIO cannot square its flat out denials of *any* use

10   to this Court with evidence that is directly to the contrary.

11   VIZIO further argues that "Oplus has no viable claim for indirect

12   infringement based on products sold prior to the filing of this action because Oplus

13   has not and cannot establish, and indeed has not even alleged, any notice of the

14   asserted patents to VIZIO prior to the filing of this action." (VIZIO Br. at 9). But

15   VIZIO has refused to produce documents that would confirm or deny VIZIO's

16   conclusory assertion. Likewise, VIZIO has refused to produce any documents that

17   would establish that none of the fourteen specifically identified VIZIO products

18   were sold after the filing of this lawsuit. Oplus is not seeking VIZIO's "secret

19   sauce" – in fact, VIZIO's previous representations to the Court indicate that it has

20   no "secret sauce" to disclose. Oplus is seeking information about sales, notice of

21   the patents-in-suit, and VIZIO's use of specific products – information both

22   focused and relevant to the issues in the case.

23

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15   IN THE UNITED STATES DISTRICT COURT
16   FOR THE CENTRAL DISTRICT OF CALIFORNIA
                        WESTERN DIVISION
17
18 OPLUS TECHNOLOGIES, LTD.,   Case No. CV12-5707 MRP (E)

                        Plaintiff,   *Assigned to the Honorable Mariana R.*
19   *Pfaelzer*
         v.
20   **NOTICE OF AMENDED**
    SEARS HOLDINGS CORPORATION   **INFRINGEMENT CONTENTIONS**
21 and VIZIO, INC.,

22   Defendants.   **JURY TRIAL DEMANDED**

23

24

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A002735

1   Pursuant to the Court's June 7, 2013 Order (Dkt. 137), Plaintiff Oplus

2   Technologies, Ltd. hereby submits its Amended Infringement Contentions, which

3   are attached hereto as Exhibits A, B, C, and D.

4   Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on June 14, 2013 the foregoing

NOTICE OF AMENDED INFRINGEMENT CONTENTIONS

was filed with the Clerk of Court using the CM/ECF system, which will then send a notification of such filing to the following counsel of record:

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Attorneys for VIZIO, Inc.

I certify that all parties in this case are represented by counsel who are CM/ECF participants.

/s/ Paul C. Gibbons
Attorneys for Oplus Technologies, Ltd.

A002737

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Vizio has infringed claims 56, 57, 58, 59, and 62 of U.S. Patent No. 7,721,840 ("the '840 patent") within the meaning of 35 U.S.C. 271(a) by using televisions or displays incorporating Faroudja DCDi technology with 3D noise reduction (motion adaptive noise reduction), including at least Vizio's P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P. (See Exhibits 14, 17, 18, 19, 20, 21, 23.)

As described, Vizio also induces and contributes to infringement within the meaningof 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

This chart is meant to be exemplary of infringement by any Vizio television or display incorporating Faroudja DCDi technology.

This chart refers to manuals for Vizio TVs, e.g. P50HDTV10A user manual (**Exhibit 14**).

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

Claim Element	Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P,GV46L, RP56, L13 and JV50P
56. A method determining entropy of a pixel of a real time streaming digital video image signal,	

Exhibit A

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Vizio's P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P televisions use Faroudja/Genesis chips to give the product advantages in video quality. See, e.g.:

Exhibit A

A002739

Infringement Chart
U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Exhibit 14, at 2

Exhibit A

A002740

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	VIZIO VM60P HDTV User Manual **Chapter 7 Miscellaneous Information** **7.1 Specifications** | Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m² (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.
Speakers	Built-in, 20W x 2
Panel Life	45,000 hours to half the original brightness
Power	
Input	IEC Connector for direct power line connection
Voltage Range	100 ~ 240Vac at 50/60Hz	
	Exhibit 17 at 63

Exhibit A

Infringement Chart
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	VIZIO GV46L HDTV User Manual ## Chapter 7 Miscellaneous Information ## 7.1 Specifications | Specifications	
Panel	46" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.7455mm (H) x 0.7455mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	16.77 Million
Brightness	500 cd/m² (typical)
Contrast	1200:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 2x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	Zero Bright Pixel, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer 640x480, 800x600, 1024x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, 6500K in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.
Speakers	Detachable, 10W x 2 + 20W Sub
Panel Life	50,000 hours to half the original brightness
Power	| **Exhibit 18** at 68.

Exhibit A

A002742

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P
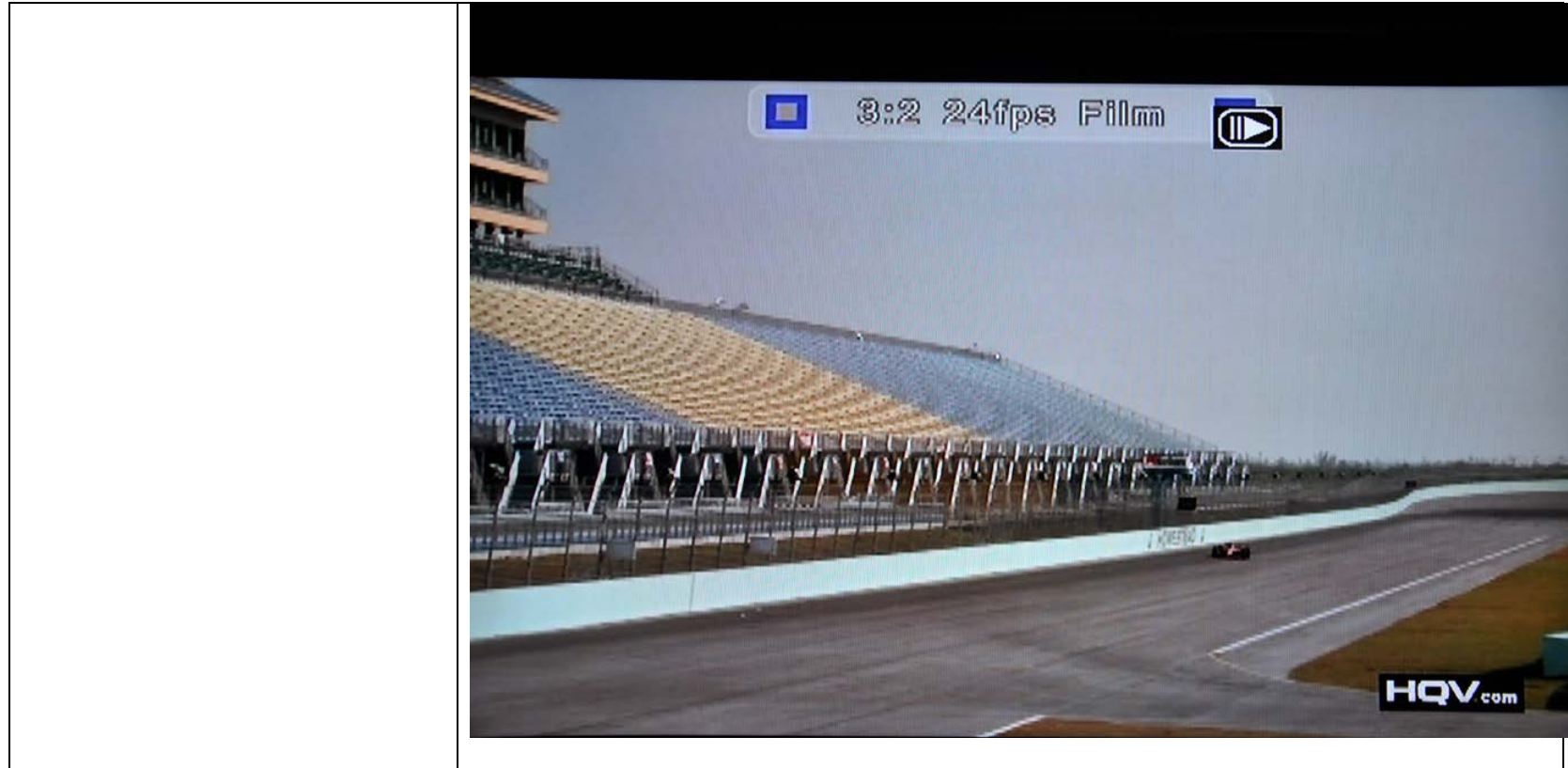
	VIZIO RP56 USER GUIDE
	1 Introduction
	Features
	• Huge 56-inch screen.
	• HDTV 16:9 Aspect Ratio.
	• Only 18.9 inches / 480 mm deep.
	• 75.9 lbs/34.5kg light.
	• Bright flicker free picture.
	• 480P, 720P, 1080I and HDTV signal compatibility.
	• 480i support for old NTSC television.
	• 640x480 VGA, 800x600 SVGA, 1024x768 XGA computer signal compatibility.
	• When displaying film-based media the TV automatically converts the content using 2:3 Pull Down to minimize motion artifacts to produce a stunning picture.
	• Uses DCDi™ Motion Adaptive Deinterlacing for state-of-the-art conversion of interlaced (NTSC or 1080i HD) to progressive scan.
	• DVI input with HDCP for the best display of Digital Video from components such as the VINC award winning Bravo Multi-Media Player that is recognized as providing the best picture from DVD and CD.
	Exhibit 19 at 1.

Exhibit A

A002743

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	VIZIO L13 LCD HDTV Specifications	
Display	Screen Size	13.0 in.
	Display Type	LCD
	Resolution	640x480
	Display Capability	480i
	Contrast Ratio	500:1
	Aspect Ratio	4:3
	Brightness	450 cd/m²
	Response Time	15 ms
	Comb Filter	3D
	Viewing Angle	H 170 / V 155⁰
	Number of Colors	16.77 Million Colors
	Backlight Life	40000 hrs.
Size	Dimensions (WxHxD)	16.8 in. x 14.2 in. x 7.7 in. (42.67 cm x 36.07 cm x 19.56 cm)
	Weight	9.0 lbs. (4.08 kg)
Input	Composite Video	1 x Composite Video
	Composite Audio	1 x Composite Audio
	S-Video	1 x S-Video
	Component Video	1 x Component Video
	Component Audio	1 x Component Audio
	PC / VGA	1 x PC / VGA
	PC / VGA Audio	1 x PC / VGA Audio
	Cable / Antenna	1 x Cable / Antenna
Output	Headphone Jack	1 x Headphone Jack
Audio	Output Mode	Stereo
	Output Power	2.5W
	Number Speakers	2
Convenience Features	Parental Lock	V-Chip
	Closed Caption	Yes
	Additional Features	DCDi De-Interlace Progressive Scan

Exhibit 20.

Exhibit A

A002744

Infringement Chart
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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	Here is Vizios newest plasma......i mean surround sound.........i guess both 🙂 http://www.vizio.com/products/detail.aspx?pid=32 Introducing VIZIO's newest All-In-One home theater solution, the VIZIO JV50P "Jive" Plasma HDTV. VIZIO's JV50P "Jive" sets a new benchmark for home entertainment, being the first TV manufacturer in the industry to offer a 50" High-Definition Plasma TV coupled with a true Dolby Digital 5.1 surround-sound system. The new JV50P "Jive" offers true digital High Definition TV performance with integrated digital TV tuner, support for 1080i resolution, amazing 15,000:1 contrast ratio and an optical audio input to allow your new VIZIO "Jive" to be your all-in-one home theater solution. DCDi by Faroudja Low Angle De-interlacing Processing for superior video quality. VIZIO Universal Backlit and ergonomic Remote Control and TV With" Wireless Speakers" option enabled, wireless transmission takes place at 5.8GHz **Exhibit 21**

Exhibit A

A002745

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	The operation of Video Processor FLI8532 The Genesis Microchip FLI8532 includes an integrated 3-D Digital Video Decoder with Faroudja DCDi CinemaTM video format conversion, video enhancement, and noise reduction. The auto-detection and Faroudja DCDi CinemaTM technology allow the FLI8532 to detect, process, and enhance any video or PC graphic format. The FLI8532 supports many worldwide VBI standards for applications of Teletext, Closed Captioning, V-Chip, and other VBI technologies. http://nationalservicealliance.com/visio/VIZIO-P50HDM.pdf (P50HDM Service Manual) The Faroudja/Genesis processing chips included in these Vizio televisions use (for instance) Genesis' Faroudja DCDi technology which performs a method determining entropy of a pixel of a real time streaming digital video image signal. This is an aspect of a motion adaptive noise reduction process. For example, from a data sheet accessed on 1-19-2011 at http://www.datasheetarchive.com/FLI2300-datasheet.html (**Exhibit 22**):

Exhibit A

A002746

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	The FLI2300 Digital Video Format Converter produces the highest quality upconverted video output from a variety of interlaced video inputs including 525i/50 (NTSC), 625i/50 (PAL or SECAM), 480p/60, 720p/60, 1080i/60 (ATSC) and RGB graphics up to SXGA, with a maximum pixel rate of 75 MHz. It uses patented and patent pending motion-adaptive deinterlacing that selects the optimal filtering on a per-pixel basis to produce maximum resolution without introducing motion artifacts. This includes film mode for proper handling of 3:2 and 2:2 pulldown as well as bad edit detection and correction, technologies invented by Faroudja Laboratories. Prior to deinterlacing, the built-in motion-adaptive noise-reducer can be used to improve the signal-to-noise ratio, resulting in further improved deinterlacing. Another proprietary feature is Directional Correlational Deinterlacing (DCDi™). This technology identifies edges at any angle in
	Vizio products operate with a real time streaming digital video image signal, commonly referred to as a video signal. In deinterlacing, noise reduction and resolution enhancement operations it is necessary to determine pixel entropy in order to properly determine which of the neighboring pixels (in time and space) a particular pixel is related to in order to properly perform these and other features to prevent, or at least greatly reduce, errors or noise in the image.
for automatically correcting an error produced during real time editing of the real time streaming digital video image input signal,	The video signal utilized by the Vizio products include movies which are originated on film and converted from film to video utilizing 3:2 pulldown conversion which produces a 3:2 cadence in the video signal. The video signals are often edited without reference to the 3:2 pulldown cadence thus creating errors in the cadence. Vizio's televisions perform error correction in real time which must, by nature, be automatic. See the pictures below, taken of the GV46L:

Exhibit A

A002747

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Exhibit A

A002748

Infringement Chart
U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

<table>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>comprising the steps of:
receiving and characterizing the streaming digital video image input signal during a pre-determined time interval;</td>
<td>Among other features of the Genesis chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. See http://www.faroudja.com/faroudja/brands/dcdi-cinema.jsp.The Motion Adaptive Noise Reduction must utilize a temporal filtering system because it must read and recognize movement, which is impossible without considering multiple frames or fields across a pre-determined time interval. In particular it is necessary to first characterize the input video signal as a particular progressive or interlaced format signal since e.g. there is no need to deinterlace a progressive signal (although a progressive signal may have been previously deinterlaced and may contain cadence error related errors which resulted from the previous deinterlacing and</td>
</tr>
</table>

Exhibit A

A002749

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	that progressive signal may also be subsequently converted to an interlaced signal). The following is from Genesis Microchip's technology page accessed on 1-19-2011 at http://www.gnss.com/technology.phtml Exhibit 24: • **Motion Adaptive Noise Reduction** Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. Genesis uses Motion Adaptive processing to reduce noise without introducing smearing.
assigning and characterizing a local neighborhood of neighboring pixels to each input image pixel of the streaming digital video image input signal, in a temporal interlaced sequence of three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal, said three consecutive fields being a previous field, a next field, and a current field; and	This element requires that the video error correction method select an area (the entirety or a subset) of a field, then also establish identical areas in the field before and the field after. This selection creates a sequence of temporal field neighborhoods for analysis for each input image pixel. The streaming digital video image input signal (i.e. the digital TV input signal) is received by the Vizio televisions during a predetermined time interval. Specifically, 3:2 deinterlacing uses a predetermined time interval comprising 3 consecutive fields. Among other features of the Genesis chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. The Motion Adaptive Noise Reduction of the Genesis chipset utilized by Vizio's televisions must consider a temporal field to detect motion and cadence with any accuracy, which is further indicated by the fact that the technology is based on temporal noise reduction filtering. Only through considering a temporally related portion of time may motion and cadence be properly detected to ensure that error correction does not affect motion to create the smearing or ghosting that Genesis warns of above. E.g., **Exhibit 25** p. 17:

Exhibit A

A002750

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135^0). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90^0.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also, Exhibit 26.

See also Faroudja's discussion of spatial and temporal filtering as a component of DCDi Cinema: http://www.faroudja.com/faroudja/brands/dcdi-cinema.jsp |
| determining the entropy of each virtual pixel, of each previous pixel, and of each next pixel, in said temporal interlaced sequence of said three consecutive fields, relative to said assigned and characterized local | This element requires the pixels of the temporal fields to be compared to detect pixels affected by noise, which is a form of video error that is based on the entropy of the data. The noise can for example result from a cadence error which results in moving (e.g. from different film frame) pixels being placed in the wrong temporal sequence. For purposes of explanation, a pixel which is temporally out of place will have a large difference as compared to its temporally neighboring pixels and thus a high entropy or randomness, which pixel may be |

Exhibit A

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Infringement Chart
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neighborhoods of said neighboring pixels, said determining comprising the steps of:	considered to be noisy. For the Genesis chipset utilized by Vizio's televisions to perform temporal comparisons, especially for the motion detection, it must measure the value of each pixel, then measure the value of other pixels in the same spatial neighborhood across multiple temporally associated frames. Comparing these values is how noise can be established to be affecting any pixels within these temporally associated frames. E.g., **Exhibit 25** p. 17**:**
	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees). With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135^0). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90^0. The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

Exhibit A

A002752

Infringement Chart
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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	See also**, Exhibit 26.** See **Exhibit 24:** **Motion adaptive noise reduction** Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.
calculating values of pixel inter-local neighborhood parameters for each said previous pixel in said previous field, and for each said next pixel in said next field, whereby each said value of each said pixel inter-local neighborhood parameter represents a regional sum of inter-local neighborhood weighted distances measured between said neighboring pixels located in subsets of said	This element is the first step of the above comprising element, where the selected area of (i.e. inter-local neighborhood) the fields are compared, detecting the changes that occur between each and to create a weighted change between each. For purposes of understanding, the changes may be considered to be inter-local noise or randomness which may result e.g. from cadence errors and/or motion. When the Genesis chipset utilized by Vizio's televisions compares these temporally related frames, the values of the neighborhood of pixels on each much be measured, then compared to establish the change over time among the temporally related fields. E.g., **Exhibit 25** p. 17**:**

Exhibit A

A002753

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assigned and characterized local neighborhood of each said virtual pixel in said current field, and said assigned and characterized local neighborhood of each said previous pixel in said previous field, and of each said next pixel, in said next field, respectively;	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).
	With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.
	The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.
	See also**, Exhibit 26.**
	See **Exhibit 24:**
	Motion adaptive noise reduction
	Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

Exhibit A

Infringement Chart

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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

calculating a value of a virtual-pixel intra-local neighborhood parameter, for each said virtual pixel in said current field;	A value is calculated for each virtual pixel which value is a measure of its randomness in its intra-local neighborhood. For purposes of understanding, the changes may be considered to be intra-local noise or randomness which may result e.g. from cadence errors and/or motion. Once the Genesis chipset utilized by Vizio's television performs its measurements and comparisons, calculation must be made to determine what the proper value of a pixel affected by noise should be. E.g., **Exhibit 25** p. 17**:**

Exhibit A

A002755

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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also**, Exhibit 26.**

See **Exhibit 24:**

Motion adaptive noise reduction

Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing. |
| adjusting a value of a pixel entropy | This element requires it to be established which pixels in each of the temporally related fields |

Exhibit A

Infringement Chart
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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

counter for each said previous pixel in said previous field, for each said next pixel in said next field, and for each said virtual pixel in said current field; and	are affected by noise or other errors, to establish the level of entropy for that pixel. After all, noise in a previous or next field should not be considered in the calculation for the proper value of a pixel in the current field. The counters are used to track which of the various pixels have large amounts of entropy as compared to their corresponding pixels in the adjacent fields. This step is known to exist because the 3:2 pulldown operation for the 3D noise reduction excludes high entropy pixels, which can be verified by those of skill observing the operation of Vizio products on a video image which is acquired from a film source. For the Genesis chipset utilized by the Vizio televisions calculations to be accurate for what the error corrected value should be, pixels also affected by noise should not be used. In addition, the chipset further relies on the measurement of movement in pixels between the frames to avoid creating ghosting by use of moving elements in the frames. E.g., **Exhibit 25** p. 17**:**

Exhibit A

A002757

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).
	With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.
	The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.
	See also**, Exhibit 26.**
	See **Exhibit 24:**
	## Motion adaptive noise reduction
	Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

Exhibit A

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calculating a value of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field from said values of said pixel entropy counters of said pixels, whereby said values of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field, in the streaming digital video input image signal are used for automatically deciding, by performing sequences of mathematical logical operations, not to use values selected from the group consisting of value of a said previous pixel in said previous field, and value of a next pixel in said next field, for assigning a real value to said virtual pixel in said current field in said global input grid of pixels featured in the streaming digital video input image signal, thereby correcting an error produced during real time editing of the streaming digital video image input signal.	This element takes the conclusions from the above steps to establish the new, proper, value for any pixels in the current field affect by noise. The Genesis chipset utilized by Vizio's televisions then uses the correct, applicable , pixels in the neighboring fields to determine the new value for the pixels in the current field that must be adjusted and then actually adjust to said value. Applying the result of the calculations to replace the pixels affected by error is also performed. Also of note, the Genesis chipset utilized by Vizio's televisions does not utilize only the Motion Adaptive Noise Reduction for temporal filtering. The TrueLife Enhancement and Cross Color Suppression also are based on temporal filtering, because they, like the above, require the measurement of movement between frames. These are features of DCDi. See http://www.faroudja.com/faroudja/brands/dcdicinema.jsp and http://www.3dsi.co.za/Techno%20Speak/Faroudja/Pages/Faroudja.htm By way of explanation, this step ensures that when a value selected for the virtual pixel of an image in the current field is selected, the pixels of a different image in the previous or next field are not utilized in that selected value. See, E.g., **Exhibit 25** p. 17**:**

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	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees). With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°. The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement. See also**, Exhibit 26.** See **Exhibit 24:** ## Motion adaptive noise reduction Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

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Claim 57	
57. The method of claim 56, whereby in step (a) the streaming digital video image input signal is received following subjecting the streaming digital video image input signal to a pull down mode conversion method selected from the group consisting of a 3:2 pull down mode conversion method, a 2:2 pull down mode conversion method, and a scan rate conversion, other than the 3:2 pull down mode conversion and the 2:2 pull down mode conversion, from a non-interlaced film format or a progressive video format to an interlaced video format.	The processing chips included in these Vizio televisions use (for instance) Genesis' Faroudja DCDi technology's Format Converter IC operates with 3:2 and 2:2 pulldown. For example, from a data sheet accessed on 1-19-2011 at http://www.datasheetarchive.com/FLI2300-datasheet.html (**Exhibit 22**): The FLI2300 Digital Video Format Converter produces the highest quality upconverted video output from a variety of interlaced video inputs including 525i/50 (NTSC), 625i/50 (PAL or SECAM), 480p/60, 720p/60, 1080i/60 (ATSC) and RGB graphics up to SXGA, with a maximum pixel rate of 75 MHz. It uses patented and patent pending motion-adaptive deinterlacing that selects the optimal filtering on a per-pixel basis to produce maximum resolution without introducing motion artifacts. This includes film mode for proper handling of 3:2 and 2:2 pulldown as well as bad edit detection and correction, technologies invented by Faroudja Laboratories. Prior to deinterlacing, the built-in motion-adaptive noise-reducer can be used to improve the signal-to-noise ratio, resulting in further improved deinterlacing. Another proprietary feature is Directional Correlational Deinterlacing (DCDi™). This technology identifies edges at any angle in moving images and interpolates along the edge to produce smooth, natural images without the staircasing or jaggies produced by other deinterlacing technologies. The FLI2300 also includes motion adaptive enhancement that improves highlight
Claim 58	
58. The method of claim 56, whereby step (b) further comprises: (i) assigning a first local neighborhood of said neighboring pixels to each said virtual pixel within a missing horizontal line of said current field.	The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit17** at 63:

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	Chapter 7 Miscellaneous Information **7.1 Specifications** | Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m² (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset. | See also, **Exhibit 14; Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**. When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises DCDi assigning a first local neighborhood of said neighboring pixels to each virtual pixel within a missing horizontal line (i.e. the even or odd lines) of the current field (which contains the odd or even lines respectively). This association arises because of the standard interlacing format of NTSC video and results in proper deinterlacing of the input video signal in the presence of static images in the video signal.
Claim 59	
59. The method of claim 58, whereby step (b) further comprises: (ii) assigning a second local neighborhood of said neighboring	The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit 17** at 63:

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pixels to each said pixel located in said previous field, and to each said pixel located in said next field.	**Chapter 7 Miscellaneous Information** **7.1 Specifications** 	Specifications		 	Panel	60" Diagonal, 16:9 Aspect Ratio	 	Resolution	1366 x 768 pixels	 	Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)	 	Display Compatibility	HDTV (720P)	 	Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)	 	Colors	1.07 Billion (10 bit)	 	Brightness	1200 cd/m^2 (typical)	 	Contrast	7000:1 (typical)	 	Viewing Angle	>178° (horizontal and vertical)	 	Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)	 	Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)	 	Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.	 See also, **Exhibit 14**; **Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**. When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises DCDi assigning a second local neighborhood of said neighboring pixels to each pixel located in the previous field and each pixel located in the next field. This association arises because of the standard interlacing format of NTSC video. This operation results in proper deinterlacing of the input video signal in the presence of image motion in the video signal.
Claim 62 62. The method of claim 59, whereby step (b) further comprises: (iii) selecting a said previous pixel and a said next pixel as two sequential pixels in said previous field and in said next field,	The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit 17** at 63:

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respectively.	**Chapter 7 Miscellaneous Information** **7.1 Specifications** | Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m² (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset. | See also, **Exhibit 14**; **Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**. When the streaming digital video image input signal is an interlaced NTSC video signal the previous pixel and the next pixel (of the spatial location corresponding to the virtual pixel) in the previous and next fields respectively are selected by DCDi as two sequential pixels. This association arises because of the standard interlacing format of NTSC video and produces proper deinterlacing in the presence of editing errors and field to field image motion.

Exhibit A

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Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

Vizio has infringed claims 56, 57, 58, 59, and 62 of U.S. Patent No. 7,271,840 ("the '840 patent") within the meaning of 35 U.S.C. 271(a) by using televisions incorporating MediaTek MDDIi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection, including at least Vizio's L42HDTV10A, GV42L, VW46L, FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820Xvideo signal processing chips with MDDi).

As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

On information and belief, many more Vizio televisions than those listed above incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection. Oplus thus reserves the right to add additional claims and/or products.

This chart refers to service manuals for the representative Vizio TVs, e.g. VW46L FDDTV10A service manual PDF pages 25-29, (**Exhibit 9**); L42HDTV10A/GV42L service manual PDF pages 20-26, 50, (**Exhibit 8**); L37HDTV service manual PDF pages 30-32, 37-43, (**Exhibit 10**); P42HDTV10A service manual PDF pages 25-28, 33-34, (**Exhibit 11**). The service manual for Vizio's VX32L and VW32L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf
The service manual for the VX37L televisionsis available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and
http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

Claim Element	Infringement by Vizio Televisions or Displays Incorporating MDDi Motion Adaptive Deinterlacing Technology with 3:2 Pulldown Detection
56. A method determining entropy of a pixel of a real time streaming digital video image signal,	Vizio TVs which utilize MediaTek MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection (hereinafter "MDDi") operate so as to determine the entropy of a pixel of a real time streaming digital video image signal (e.g. a recorded or broadcast digital television signal). Specifically, MDDi utilizes 3:2 deinterlacing. In 3:2 deinterlacing, in order to determine if a

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	given pixel belongs to one field or another, i.e. to determine which field or frame it is related to, it is necessary to determine its entropy. This must be done in real time in order for the Vizio TV to display real time video programs. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57 Vizio products operate with a real time streaming digital video image signal, commonly referred to as a video signal. In deinterlacing, noise reduction and resolution enhancement operations it is necessary to determine pixel entropy in order to properly determine which of the neighboring pixels (in time and space) a particular pixel is related to in order to properly perform these and other features to prevent, or at least greatly reduce, errors or noise in the image.
for automatically correcting an error produced during real time editing of the real time streaming digital video image input signal,	The video signal utilized by the Vizio products include movies which are originated on film and converted from film to video utilizing 3:2 pulldown conversion which produces a 3:2 cadence in the video signal. The video signals are often edited without reference to the 3:2 pulldown cadence thus creating errors in the cadence. Vizio's televisions perform error correction in real time which must, by nature, be automatic. See Ex. 8, pp. 21, 26, 50, 52; Ex. 9 , pp. 26, 29, Ex. 10, pp. 38, 43, 59, 61; Ex. 11, pp. 34, 39, 55, 57
comprising the steps of: receiving and characterizing the streaming digital video image input signal during a pre-determined time interval;	The streaming digital video image input signal (i.e. the digital TV input signal) is received by the Vizio televisions during a predetermined time interval. Specifically, the 3:2 deinterlacing performed by MDDi uses a predetermined time interval comprising 3 consecutive fields. Among other features of the Mediatek chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. The Motion Adaptive Noise Reduction must utilize a temporal filtering system because it must read and recognize movement, which is impossible without considering multiple frames or fields across a pre-determined time interval. In particular it is necessary to first characterize the input video signal as a particular progressive or interlaced format signal since there is no need to deinterlace a progressive signal (although a progressive signal may have been previously deinterlaced and may contain cadence error related errors which resulted from the previous deinterlacing and that progressive signal may also be subsequently converted to an interlaced signal).

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	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. MediatTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (Ex. 16) Please note that, in considering the issue of infringement, the issue of an accused infringer's patent corresponding to its infringing product "warrants consideration by the trier of fact, along with the other evidence of the differences and similarities of the patented and accused devices[.]" *National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185 , 1191 –92 (Fed. Cir. 1996). While Mediatek admittedly has many patents, its descriptions in the available literature to its patent-pending MDDi "de-interlacing" solution (with some Mediatek references to such technology going back to the 2003 time frame) drastically narrows the list. Specifically, per Lexis, only 5 issued US patents assigned to Mediatek were filed in 2003 or earlier which use the word "de-interlacing." See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57
assigning and characterizing a local neighborhood of neighboring pixels to each input image pixel of the streaming digital video image input signal, in a temporal interlaced sequence of three consecutive fields in a global input grid of pixels	The streaming digital video image input signal received by the Vizio televisions contains pixels. MDDi 3:2 deinterlacing requires 3 fields commonly referred to in the art as the current, previous, and next fields. MDDi operates to assign and characterize a local neighborhood of neighboring pixels for each input image pixel of an image in a temporal interlace sequence of the three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal.

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included in the streaming digital video input image signal, said three consecutive fields being a previous field, a next field, and a current field; and	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. E.g., Mediatek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**) See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57.
determining the entropy of each virtual pixel, of each previous pixel, and of each next pixel, in said temporal interlaced sequence of said three consecutive fields, relative to said assigned and characterized local neighborhoods of said neighboring pixels, said determining comprising the steps of:	This element requires the pixels of the temporal fields to be compared to detect pixels affected by noise, which is a form of video error that is based on the entropy of the data. The noise can for example result from a cadence error which results in moving (e.g. from different film frame) pixels being placed in the wrong temporal sequence. For purposes of explanation, a pixel which is temporally out of place will have a large difference as compared to its temporally neighboring pixels and thus a high entropy or randomness, which pixel may be considered to be noisy. In order to perform 3:2 deinterlacing, MDDI must determine the entropy of each virtual pixel and the previous and next pixel from the previous and next fields in order to know or estimate which of those pixels are obtained from or belong to the same input image frame. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57. This necessarily requires the following steps, as set forth below.
calculating values of pixel inter-local neighborhood parameters for each said previous pixel in said previous field, and for each said next pixel in	This element is the first step of the above "comprising" element, where the selected area of (i.e. inter-local neighborhood) the fields are compared, detecting the changes that occur between each and to create a weighted change between each. For purposes of understanding, the changes may be considered to be inter-local noise or randomness which may result, for

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said next field, whereby each said value of each said pixel inter-local neighborhood parameter represents a regional sum of inter-local neighborhood weighted distances measured between said neighboring pixels located in subsets of said assigned and characterized local neighborhood of each said virtual pixel in said current field, and said assigned and characterized local neighborhood of each said previous pixel in said previous field, and of each said next pixel, in said next field, respectively;	example, from cadence errors and/or motion. The values of parameters for the previous and next field neighborhoods are calculated for each pixel in the previous and next field. The parameters represent the distance weighted sum relative to the virtual pixel for each previous and next field neighborhood. In order to perform 3:2 deinterlacing MDDi must determine the neighborhood parameters of each previous and next pixel neighborhoods from the previous and next fields in order to know or estimate which of the pixels are obtained from or belong to the same input image frame in the presence of field to field motion which results from temporally adjacent fields being derived from different image frames.
calculating a value of a virtual-pixel intra-local neighborhood parameter, for each said virtual pixel in said current field;	A value is calculated for each virtual pixel which value is a measure of its randomness in its intra-local neighborhood. For purposes of understanding, the changes may be considered to be intra-local noise or randomness which may result e.g. from cadence errors and/or motion. The parameter value of the virtual pixel local neighborhood (i.e. the neighborhood in the same or current field as the virtual pixel) is calculated for each virtual pixel. In order to perform 3:2 deinterlacing MDDi must determine the neighborhood parameters of the virtual pixel neighborhood in order to know or estimate which of the previous or next pixels are obtained from or belong to the same film image frame as the virtual pixel.
adjusting a value of a pixel entropy counter for each said previous	This element requires it to be established which pixels in each of the temporally related fields are affected by noise or other errors, to establish the level of entropy for that pixel. After all,

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pixel in said previous field, for each said next pixel in said next field, and for each said virtual pixel in said current field; and	noise in a previous or next field should not be considered in the calculation for the proper value of a pixel in the current field. The counters are used to track which of the various pixels have large amounts of entropy as compared to their corresponding pixels in the adjacent fields. The pixel entropy counter value for each previous and next field pixel is adjusted, as well as for each current field virtual pixel. In order for MDDi to determine or estimate which adjacent field pixel is most closely related to the virtual pixel an entropy counter is utilized to avoid false triggering due to noise, which false triggering would create undesirable image artifacts in the presence of random noise. The value of pixel entropy of the counter is adjusted for each of the previous, next and virtual pixel. This step is known to exist because the 3:2 pulldown operation for the 3D noise reduction excludes high entropy pixels, which can be verified by those of skill observing the operation of Vizio products on a video image which is acquired from a film source.
calculating a value of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field from said values of said pixel entropy counters of said pixels, whereby said values of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field, in the streaming digital video input image signal are used for automatically deciding, by	This element takes the conclusions from the above steps to establish the new, proper, value for any pixels in the current field affected by noise. An entropy value is calculated for each previous and next field pixel and for each current field virtual pixel. The values are used to automatically decide, using mathematical logical operations (e.g. digital logic) not to use value of the previous pixel or next pixel to assign a real value to the virtual pixel. By not using one of the previous pixel or next pixel value an error produced during editing of the interlaced video signal is corrected. The values of the pixel entropy counters are utilized by MDDi to calculate a value of entropy for each pixel in the previous, next and present field in order that those values are reasonably accurate and immune to random noise but nevertheless represent the entropy of the respective pixel thereby reducing or preventing improper values of the previous and next pixels from being assigned to the value. By way of explanation, this step ensures that when a value selected for the virtual pixel of an image in the current field is selected that is out of the acceptable range, the pixels of a different image in the previous or next field are not utilized in that selected value.

Exhibit B

A002770

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

performing sequences of mathematical logical operations, not to use values selected from the group consisting of value of a said previous pixel in said previous field, and value of a next pixel in said next field, for assigning a real value to said virtual pixel in said current field in said global input grid of pixels featured in the streaming digital video input image signal, thereby correcting an error produced during real time editing of the streaming digital video image input signal.	
Claim 57	
57. The method of claim 56, whereby in step (a) the streaming digital video image input signal is received following subjecting the streaming digital video image input signal to a pull down mode conversion method selected from the group consisting of a 3:2 pull down mode conversion method, a 2:2 pull down mode conversion method, and a scan rate conversion, other than the 3:2 pull down mode conversion and the 2:2 pull down mode conversion, from a non-interlaced film format or a progressive video format to an interlaced video format.	Vizio Televisions with MDDi utilize a 3:2 and 2:2 pull down mode conversion method.

Exhibit B

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	G . Video Processing :
	
	  1. Advanced Motion adaptive de-interlace on SDTV resolution.
	
	  2. Support clip
	
	  3. 3:2/2:2 pull down source detection.
	
	  4. Arbitrary ratio vertical/horizontal scaling of video , from 1/15X to 16X.
	
	  5. Support Edge preserve.
	
	  6. Support horizontal edge enhancement.
	
	  7. Support Quad-Picture.
	
	Exhibit 11, p. 57.
	
	See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9** , pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55.

Claim 58	

Exhibit B

A002772

Infringement Chart
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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

58. The method of claim 56, whereby step (b) further comprises: (i) assigning a first local neighborhood of said neighboring pixels to each said virtual pixel within a missing horizontal line of said current field.	Vizio TVs utilize NTSC video signals. **Chapter 1 Features** • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit** 9, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises MDDi assigning a first local neighborhood of said neighboring pixels to each virtual pixel within a missing horizontal line (i.e. the even or odd lines) of the current field (which contains the odd or even lines respectively). This association arises because of the standard interlacing format of NTSC video.
Claim 59	
59. The method of claim 58, whereby step (b) further comprises: (ii) assigning a second local neighborhood of said neighboring pixels to each said pixel located in said previous field, and to each said pixel located in said next field.	Vizio TVs utilize NTSC video signals. **Chapter 1 Features** • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit 9**, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal step

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	(b) further comprises MDDi assigning a second local neighborhood of said neighboring pixels to each pixel located in the previous field and each pixel located in the next field. This association arises because of the standard interlacing format of NTSC video.
Claim 62 62. The method of claim 59, whereby step (b) further comprises: (iii) selecting a said previous pixel and a said next pixel as two sequential pixels in said previous field and in said next field, respectively.	**Chapter 1 Features** • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit 9**, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal the previous pixel and the next pixel (of the spatial location corresponding to the virtual pixel) in the previous and next fields respectively are selected by MDDi as two sequential pixels. This association arises because of the standard interlacing format of NTSC video.

Exhibit B

A002774

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

Vizio has infringed claims 7, 8, 9, 14, 15 of U.S. Patent No. 6,239,842 ("the '842 patent") within the meaning of 35 U.S.C. 271(a) by using televisions or displays incorporating HQV technology, including at least Vizio's VP505XVT, VP504F, and VP605F. (See **Exhibits 2** and **6**).

As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

On information and belief, more Vizio televisions than those listed above incorporate HQV technology. This chart is meant to be exemplary of infringement by any Vizio television incorporating HQV technology. Oplus reserves the right to add additional claims and/or products.

This chart refers to manuals for Vizio TVs, e.g. VP505XVT user manual pages, (**Exhibit 1**); VP504F user manual pages (**Exhibit 7**). This claim chart is meant to be exemplary of infringement by any Vizio television incorporating HQV technology.

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and
http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

Claim	Infringement by Vizio Televisions Incorporating HQV
Claim 7	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with HQV, including Vizio's VP505XVT televisions, make use of HQV technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal. From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**):

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A002775

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

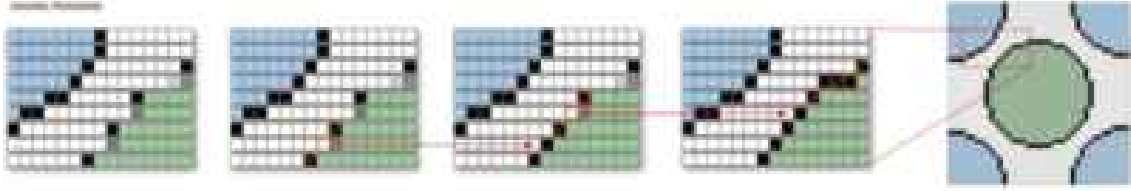|	
	VP505XVT FULL 1080p Plasma with SILICON OPTIX HQV (Hollywood Quality Video) Processing VIZIO jumps deeper into Full High-Definition 1080p plasma performance with a bang to capture the imagination of even the most discerning consumers with the 50" VIZIO VP505XVT. Plasma TVs are the preferred choice for superior color, higher contrast ratios, longer panel life and fast refresh rates. To ensure smooth, crisp, clean, and more vibrant images, VIZIO integrated the Silicon Optix's REON HQV processing into the VP505XVT. This advanced technology brings out even the finest details with both Standard Definition (SD) and High Definition (HD) sources. Rendered colors are more natural, showing true color tones as they were intended. Moreover, Silicon Optix HQV's advanced noise reduction removes noise and artifacts caused by signal compression from cable and satellite providers. Since the HQV's REON chip can process two full channels of HD or SD channels, this allows users to achieve full resolution with picture-in-picture images. (See also, Exhibit 6). Vizio further points out how this product is being sold through retailers such as Sears, Costco, and Sam's Club: Available through traditional consumer electronics retailers such as Circuit City and Sears and Club retailers like Costco and Sam's Club, the new VIZIO VP505XVT will ship in July with an estimated selling price of $1699.99. http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**) Hollywood Quality Video (HQV) advertises on their website this model makes use of such technology. From HQV's website's products page assessed on 11-27-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=products.displays (**Exhibit 3**)

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Exhibit C

A002776

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	Vizio The Vizio VP505XVT products feature the finest technology available today, Including HQV® Hollywood Quality Video™ processing working with full high definition 1080p resolution, these plasma displays offer great visual experience in high-definition flat panel technology. Whether it's High Definition, Standard Definition, or EDTV, the signals are reproduced with amazing results. VP505XTV 50" Plasma TV HQV is a technology suite that performs many video error correction and video enhancement processes, including a pixel-based motion adaptive de-interlacing process. This process is shown on HQV's website's de-interlacing technology page accessed on 1-20-2011 and and August 2, 2012 at http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**): **IDT HQV approach (pixel-based motion adaptive)** HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. Pixel-based motion-adaptive de-interlacing avoids artifacts in moving objects and preserves full resolution of non-moving portions of the screen even if neighboring pixels are in motion.
(a) receiving the interlaced video format feature a sequence of fields of pixels to be de-interlaced;	The Vizio televisions receive an interlaced format video signal which is made up of a sequence of interlaced fields of pixels. HQV technology includes de-interlacing video, and states that 4 fields are used "to implement a true per-pixel motion-adaptive deinterlacer." The 4 fields being

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Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	part of the sequence of fields of the interlaced format video signal. http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**):
(b) evaluating logical operations of linear combinations of values selected from the group consisting of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor'; and	This element requires that the missing pixels, that is the spatial pixels which are missing from an interlaced video field, are identified through averaging and/or other mathematical operations, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels. For example, the values of the missing pixels will be determined using the values of existing pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image.

Vizio televisions using HQV technology utilize HQV's pixel-based motion adaptive de-interlacing technique to try to correct these sorts of common errors as well. HQV notes that its pixel-based motion adaptive process for de-interlacing discards only pixels that would cause artifacts by analyzing movement at the pixel level across temporally related fields to measure the movement. In other words, HQV's processes must take a multitude of potential values to be used to fill in for the missing current pixels and perform logical operations upon them to determine the best fit value in light of the motion present.

The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital HQV ICs utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital HQV ICs to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.

As stated by Jed Deame, a co-founder and General Manager of Teranex/SiliconOptix: |

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Infringement Chart
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Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. * * * "Second Stage" Diagonal Interpolation To recover some of the detail lost in the areas in motion, HQV processing implements a multi-direction diagonal filter that reconstructs some of the lost data at the edges of moving objects, filtering out any "jaggies." This operation is called "second-stage" diagonal interpolation because it's performed after the deinterlacing, which is the first stage of processing. Since diagonal interpolation is independent of the de-interlacing process, competitors have used similar algorithms with their frame-based de-interlacing approaches.

<div align="center">5</div>

Exhibit C

<div align="center">A002779</div>

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	http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)**
(c) deciding upon assignment of values to missing spatial pixels according to results of said logical operations	As shown above, Vizio televisions using HQV must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image (e.g., where motion is not detected), and through the step of assignment of values based upon, e.g., diagonal interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the deinterlaced image are avoided.
Claim 8	
The method of claim 7, wherein said sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of aid fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields.	Because the interlaced video signals which the Vizio Televisions with HQV all meet video standards (e.g. NTSC, 1080i HDTV) the sequence of fields of pixels to be deinterlaced features a current spatial field featuring missing spatial pixels (i.e. the missing pixels of the missing scan lines of video) and spatial pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values) and at least one temporal field (e.g. the immediately previous or immediately past field) with temporal pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values. See http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 3)** ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").

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Claim 9	
The method of claim 7, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the HQV technology to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame. See http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf (**Exhibit 3**) ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").
Claim 14	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio Televisions with HQV make use of HQV technology to give them an advantage in video quality, and in particular an advantage in deinterlacing when receiving a 1080i HD signal and/or 480i signal and converting to progressive video. From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**): From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**):

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A002781

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Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

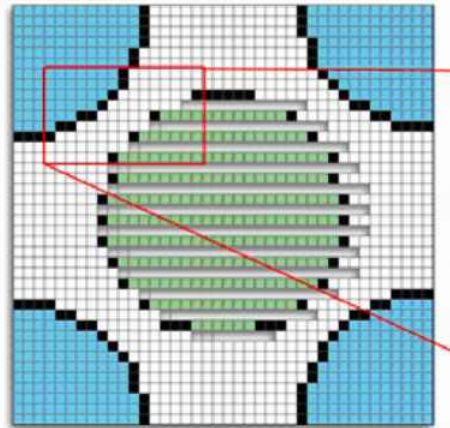|	
	VP505XVT FULL 1080p Plasma with SILICON OPTIX HQV (Hollywood Quality Video) Processing VIZIO jumps deeper into Full High-Definition 1080p plasma performance with a bang to capture the imagination of even the most discerning consumers with the 50" VIZIO VP505XVT. Plasma TVs are the preferred choice for superior color, higher contrast ratios, longer panel life and fast refresh rates. To ensure smooth, crisp, clean, and more vibrant images, VIZIO integrated the Silicon Optix's REON HQV processing into the VP505XVT. This advanced technology brings out even the finest details with both Standard Definition (SD) and High Definition (HD) sources. Rendered colors are more natural, showing true color tones as they were intended. Moreover, Silicon Optix HQV's advanced noise reduction removes noise and artifacts caused by signal compression from cable and satellite providers. Since the HQV's REON chip can process two full channels of HD or SD channels, this allows users to achieve full resolution with picture-in-picture images. (See also, Exhibit 6). Vizio further points out how this product is being sold through retailers such as Sears, Costco, and Sam's Club: Available through traditional consumer electronics retailers such as Circuit City and Sears and Club retailers like Costco and Sam's Club, the new VIZIO VP505XVT will ship in July with an estimated selling price of $1699.99. http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**) Hollywood Quality Video (HQV) advertises on their website this model makes use of such technology. From HQV's website's products page assessed on 11-27-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=products.displays (**Exhibit 3**)

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Infringement Chart
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Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	Vizio The Vizio VP505XVT products feature the finest technology available today, Including HQV® Hollywood Quality Video™ processing working with full high definition 1080p resolution, these plasma displays offer great visual experience in high-definition flat panel technology. Whether it's High Definition, Standard Definition, or EDTV, the signals are reproduced with amazing results. VP505XTV 50" Plasma TV HQV is a technology suite that performs many video error correction and video enhancement processes, including a pixel-based motion adaptive de-interlacing process. This process is shown on HQV's website's de-interlacing technology page accessed on 1-20-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**): **IDT HQV approach (pixel-based motion adaptive)** HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. Pixel-based motion-adaptive de-interlacing avoids artifacts in moving objects and preserves full resolution of non-moving portions of the screen even if neighboring pixels are in motion.
receiving the interlaced video format featuring a sequence of fields of pixels to be de-interlaced;	The Vizio televisions receive an interlaced format video signal which is made up of a sequence of interlaced fields of pixels. HQV technology includes de-interlacing video, and states that 4 fields are used "to implement a true per-pixel motion-adaptive deinterlacer."

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	http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**): The 4 fields being part of the sequence of fields of the interlaced format video signal.
using a current spatial field featuring missing spatial pixels and said spatial pixels with known values, located in said sequence of said pixels,…	HQV's deinterlacing process includes "the two fields being analyzed in the current frame[.]" http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**). For purposes of understanding, the current field may be considered the one of the two which is being deinterlaced.
and one temporal field featuring temporal pixels with known values, located in said sequence of said fields,…	"In addition to the two fields being analyzed in the current frame, the two previous fields are required in order to determine which pixels are in motion." http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**). "HQV Processing continues to analyze at the per-pixel level using four-field analysis even in high-definition." http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**) For purposes of understanding, the temporal field is one being used along with the current field to accomplish deinterlacing of the current field.
…for determining values of said missing pixels of said current spatial field;	Vizio televisions incorporating HQV use the data from the temporally related fields (as detailed further below) to establish the values of the missing pixels. E.g. the current field and the temporal field are utilized to provide values for the missing pixels in the current spatial field.
evaluating logical operations of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said	This element requires that the missing pixels are identified through averaging and/or other mathematical operations, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's

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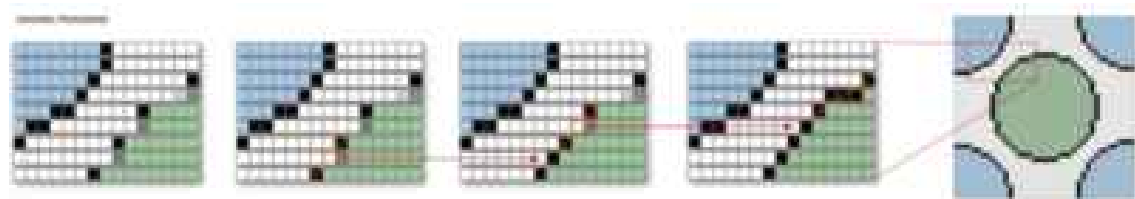
known values of said temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, `and`, `or`, and `xor`; and	missing pixels. For example, the values of the missing pixels will be determined using the values of existing pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image. Vizio televisions using HQV technology utilize HQV's pixel-based motion adaptive de-interlacing technique to try to correct these sorts of common errors as well. HQV notes that its pixel-based motion adaptive process for de-interlacing discards only pixels that would cause artifacts by analyzing movement at the pixel level across temporally related fields to measure the movement. In other words, HQV's processes must take a multitude of potential values to fill in for the missing current pixels and perform logical operations upon them to determine the best fit value in light of the motion present. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital HQV ICs utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital HQV ICs to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images. As stated by Jed Deame, a co-founder and General Manager of Teranex/SiliconOptix: HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution.

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* * *

"Second Stage" Diagonal Interpolation To recover some of the detail lost in the areas
in motion, HQV processing implements a multi-direction diagonal filter that
reconstructs some of the lost data at the edges of moving objects, filtering out any
"jaggies." This operation is called "second-stage" diagonal interpolation because it's
performed after the deinterlacing, which is the first stage of processing. Since diagonal
interpolation is independent of the de-interlacing process, competitors have used
similar algorithms with their frame-based de-interlacing approaches.

http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)**

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Exhibit C

A002786

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

deciding upon assignment of said values to said missing spatial pixels according to results of said logical operations.	As shown above, Vizio televisions using HQV must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image (e.g., where motion is not detected), and through the step of assignment of values based upon, e.g., diagonal interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts.
Claim 15	
The method of claim 14, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the HQV technology to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame. See http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)** ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").

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Exhibit C

A002787

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Vizio has infringed claims 7, 8, 9, 14, and 15 of U.S. Patent No. 6,239,842 ("the '842 patent") within the meaning of 35 U.S.C. 271(a) by using televisions or displays incorporating MediaTek MDDi Motion Adaptive Deinterlacing technology, including at least Vizio's L42HDTV10A, GV42L, VW46L FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820X video signal processing chips with MDDi).

As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

On information and belief, many more Vizio televisions than those listed above incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing technology. Oplus reseves the right to add additional claims and/or products.

This chart refers to service manuals for the representative Vizio TVs, e.g. VW46L FHDTV10A service manual PDF pages 25-29, (**Exhibit 9**); L42HDTV10A/GV42L service manual PDF pages 20-26, 50, (**Exhibit 8**); L37HDTV service manual PDF pages 30-32, 37-43 (**Exhibit 10),** P42HDTV10A service manual PDF pages 25-28, 33-34, (**Exhibit 11**). The service manual for Vizio's VX32L and VW32L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf
The service manual for the VX37L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and
http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

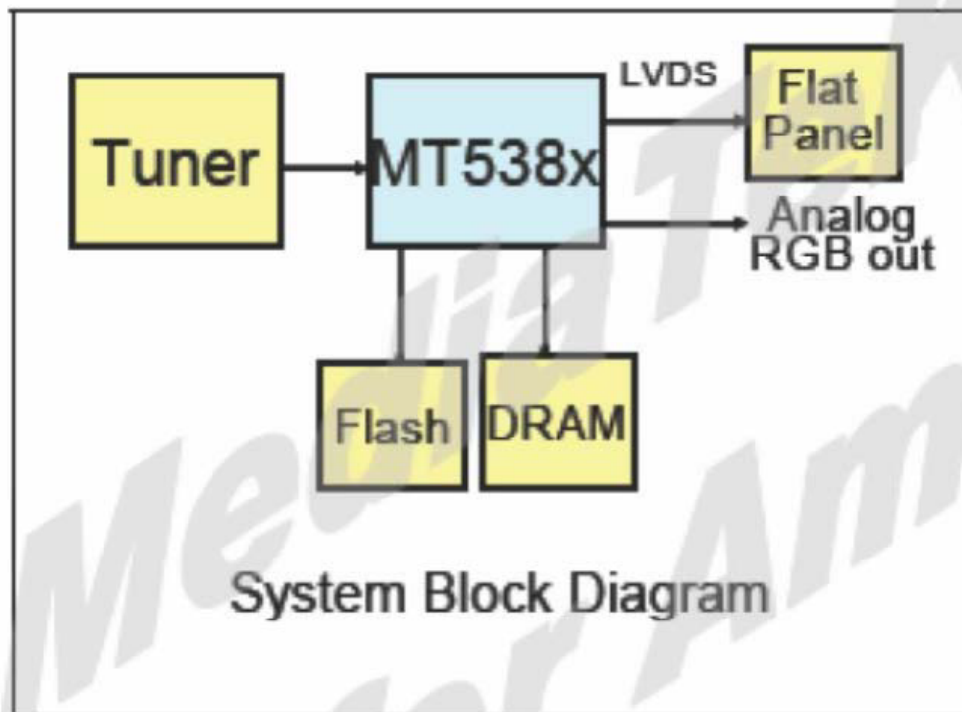| Claim	Infringement by Vizio Televisions Incorporating MDDi
Claim 7	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with MDDi use that technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal. All Vizio flat panel (e.g. HDTV) televisions must deinterlace received interlaced video signal

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Exhibit D

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	(e.g. NTSC, 1080i HDTV) in order to display those signals in progressive form on the flat panel.

See **Exhibit 8**, p. 26:

3. De-interlacing

2nd generation advanced Motion adaptive de-interlacing

Automatic detect film or video source

3:2/2:2 pull down source detection

Main/PIP 2 independent de-interlacing processor

See **Exhibit 8**, p. 50:

whole new viewing experience. Credible Audio/Video Quality : The MT5351 use advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback , The embedded

See **Exhibit 9**, p. 26:

World-Leading Audio/Video Technology: The MT538x family has built-in high resolution and high-quality audio codec. It includes MediaTek MDDi™ de-interlace solution to generate very smooth picture quality for motions. A 3D comb filter added to the TV decoder recovers great detail for still pictures. The special color processing technology provides natural, deep colors and true studio quality graphics.

See **Exhibit 9**, p. 29: |

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Exhibit D

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

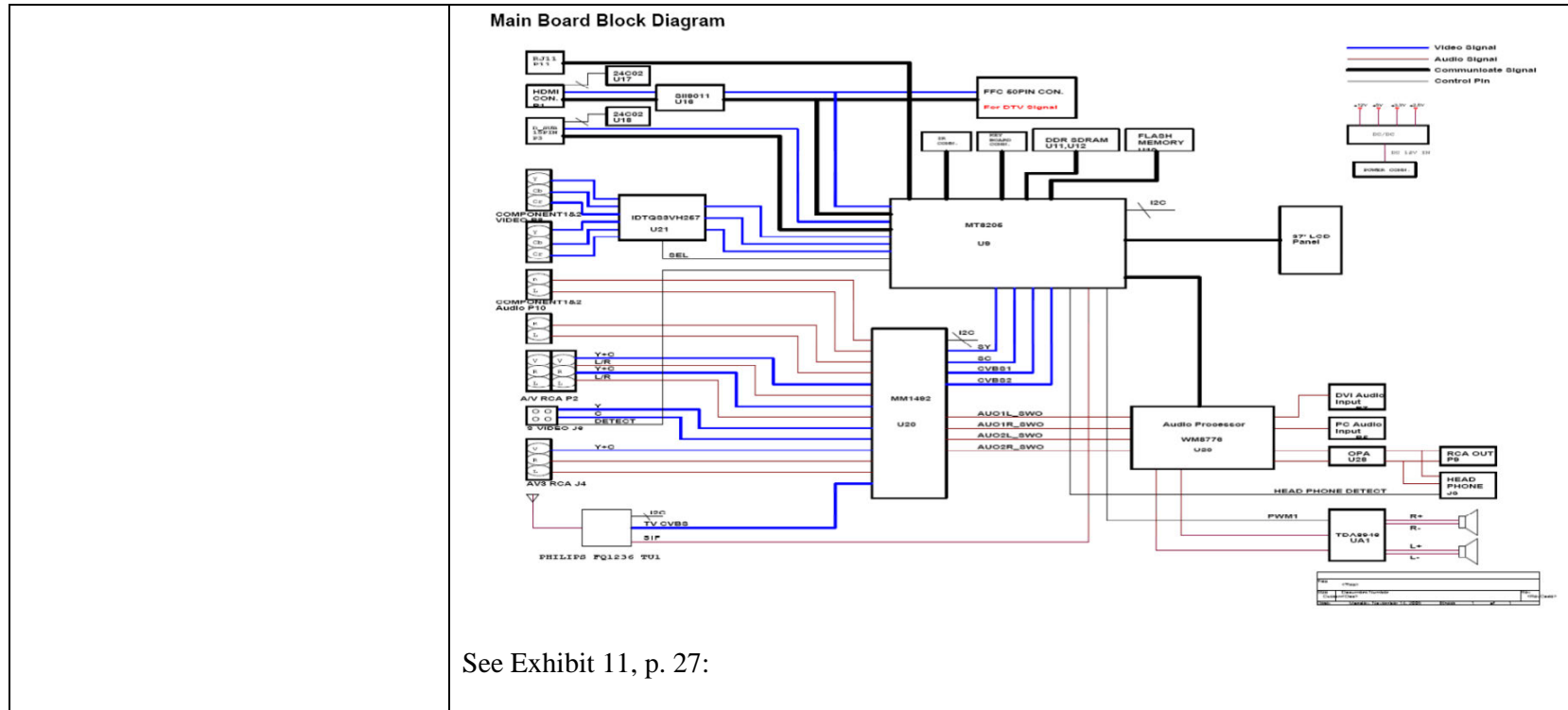|	

	10. Automatic detect films or video sources
	11. 3:2/2:2 pull down source detection
	12. The MT5380 support bob mode de-interlace.
	    The MT5381 support 1366 width motion-adaptive de-interlace.
	    The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire MT538x family supports excellent low angle image processing.
	
	See **Exhibit 10**, p. 38:
	
	MT8205 Application
	MT8205 is a highly integrated single chip for LCD TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor.
	
	See **Exhibit 10**, p. 43:
	
	b. De-interlacing
	Automatic detect film or video source
	3:2/2:2 pull down source detection
	Advanced Motion adaptive de-interlacing
	
	See **Exhibit 11**, p. 34:

3

Exhibit D

A002790

Infringement Chart
U.S. Patent No. 6,239,842
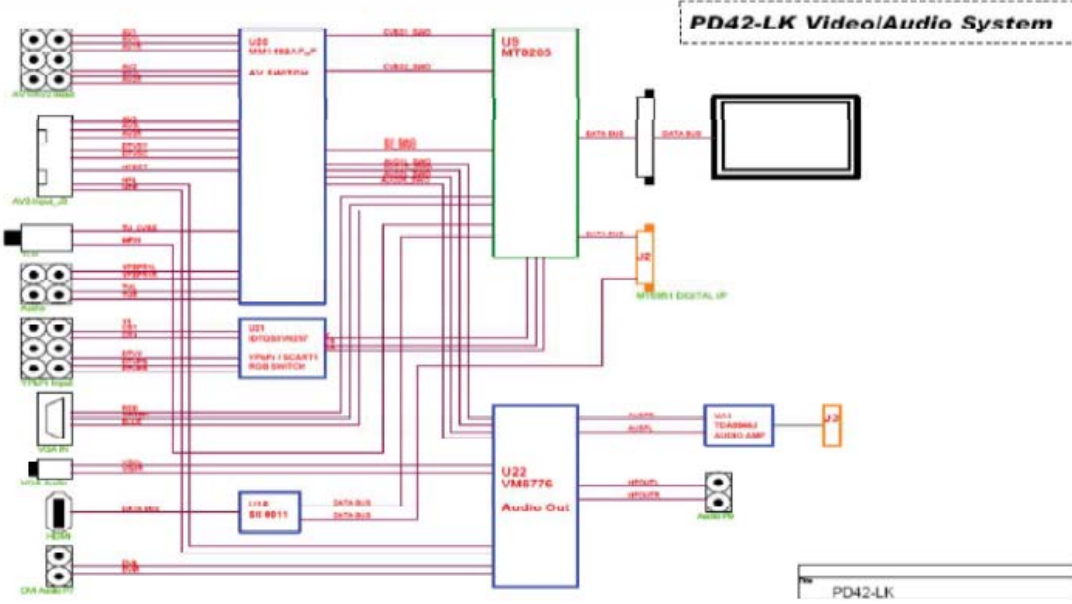**Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology**

	MT8205 Application MT8205 is a highly integrated single chip for PDP TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. Optional 2nd HDTV or SDTV inputs allows user to see multi-programs on same screen. Flexible scalar provides wide adoption to various PDP panel for different video sources. Its on-chip audio processor decodes analog signals from Tuner with lip sync control, delivering high quality post-processed sound effect to customers. On-chip microprocessor reduces the system BOM and shortens the schedule of UI design by high level C program. MT8205 is a cost-effective and high performance HDTV-ready solution to TV manufactures.
(a) receiving the interlaced video format feature a sequence of fields of pixels to be de-interlaced;	The interlaced video signal is received by the TV via an antenna connector and tuner and/or video connector. Interlaced video signals by definition incorporate a sequence of fields of pixels with the commonly used interlaced video signals (e.g. NTSC 480i, 1080i) having two fields with one field containing all of the even scan lines and the other field containing all of the odd scanning lines. The fields by definition have missing scanning lines and thus missing pixels of those scanning lines. See **Exhibit 8**, p. 21:

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Exhibit D

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

BOLOCK DIAGRAM

See Exhibit 9, p. 27:

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Exhibit D

A002792

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

See Exhibit 10, p. 31:

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Exhibit D

A002793

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Main Board Block Diagram

See Exhibit 11, p. 27:

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Exhibit D

A002794

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Main Board Block Diagram

(b) evaluating logical operations of linear combinations of values selected from the group consisting of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels,	This element requires that the missing pixels, that is the spatial pixels which are missing from an interlaced video field, are identified through averaging, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels. For example, the values of the missing pixels will be determined using the values of existing spatial pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image.

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Exhibit D

A002795

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor'; and	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants.

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Exhibit D

A002796

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (Exhibit 15):

FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'.

Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation

Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations.

Please note that, in considering the issue of infringement, the issue of an accused infringer's patent corresponding to its infringing product "warrants consideration by the trier of fact, along with the other evidence of the differences and similarities of the patented and accused devices[.]" *National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185 , 1191 –92 (Fed. Cir. 1996). While Mediatek admittedly has many patents, its descriptions in the available literature to its patent-pending MDDi "de-interlacing" solution (with some Mediatek references to such technology going back to the 2003 time frame) drastically narrows the list. Specifically, per Lexis, only 5 issued US patents assigned to Mediatek were filed in 2003 or earlier which use the word "de-interlacing."

The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
(c) deciding upon assignment of values to missing spatial pixels according to results of said logical operations	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images artifacts in the deinterlaced image are avoided. Based on the logical operations, the MDDi circuit makes the assignment of the values to the missing spatial pixels according to the results thus completing the deinterlacing operation.
Claim 8	
The method of claim 7 , wherein said sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of aid fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields.	Because the interlaced video signals which the Vizio televisions with MDDi deinterlacing all meet video standards (e.g. NTSC, 1080i HDTV) the sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels (i.e. the missing pixels of the missing scan lines of video) and spatial pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values) and at least one temporal field (e.g. the immediately previous or immediately past field) with temporal pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values).
Claim 9	

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

The method of claim 7, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the MDDi circuit to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field.
Claim 14	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with MDDi use that technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal.

All Vizio flat panel (e.g. HDTV) televisions when receiving a 1080i HD signal or a 480i signal and feeding a progressive video television must deinterlace received interlaced video signal (e.g. NTSC, 1080i HDTV) in order to display those signals in progressive form on the flat panel.
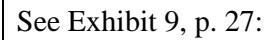
See **Exhibit 8**, p. 26: |

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Exhibit D

A002799

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

3.De-interlacing 2nd generation advanced Motion adaptive de-interlacing Automatic detect film or video source 3:2/2:2 pull down source detection Main/PIP 2 independent de-interlacing processor See **Exhibit 8**, p. 50: whole new viewing experience.Credible Audio/Video Quality : The MT5351 use advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback , The embedded See **Exhibit 9**, p. 26: **World-Leading Audio/Video Technology:** The MT538x family has built-in high resolution and high-quality audio codec. It includes MediaTek MDDi™ de-interlace solution to generate very smooth picture quality for motions. A 3D comb filter added to the TV decoder recovers great detail for still pictures. The special color processing technology provides natural, deep colors and true studio quality graphics. See **Exhibit 9**, p. 29: 10. Automatic detect films or video sources 11. 3:2/2:2 pull down source detection 12. The MT5380 support bob mode de-interlace. The MT5381 support 1366 width motion-adaptive de-interlace. The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire MT538x family supports excellent low angle image processing.

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Exhibit D

A002800

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

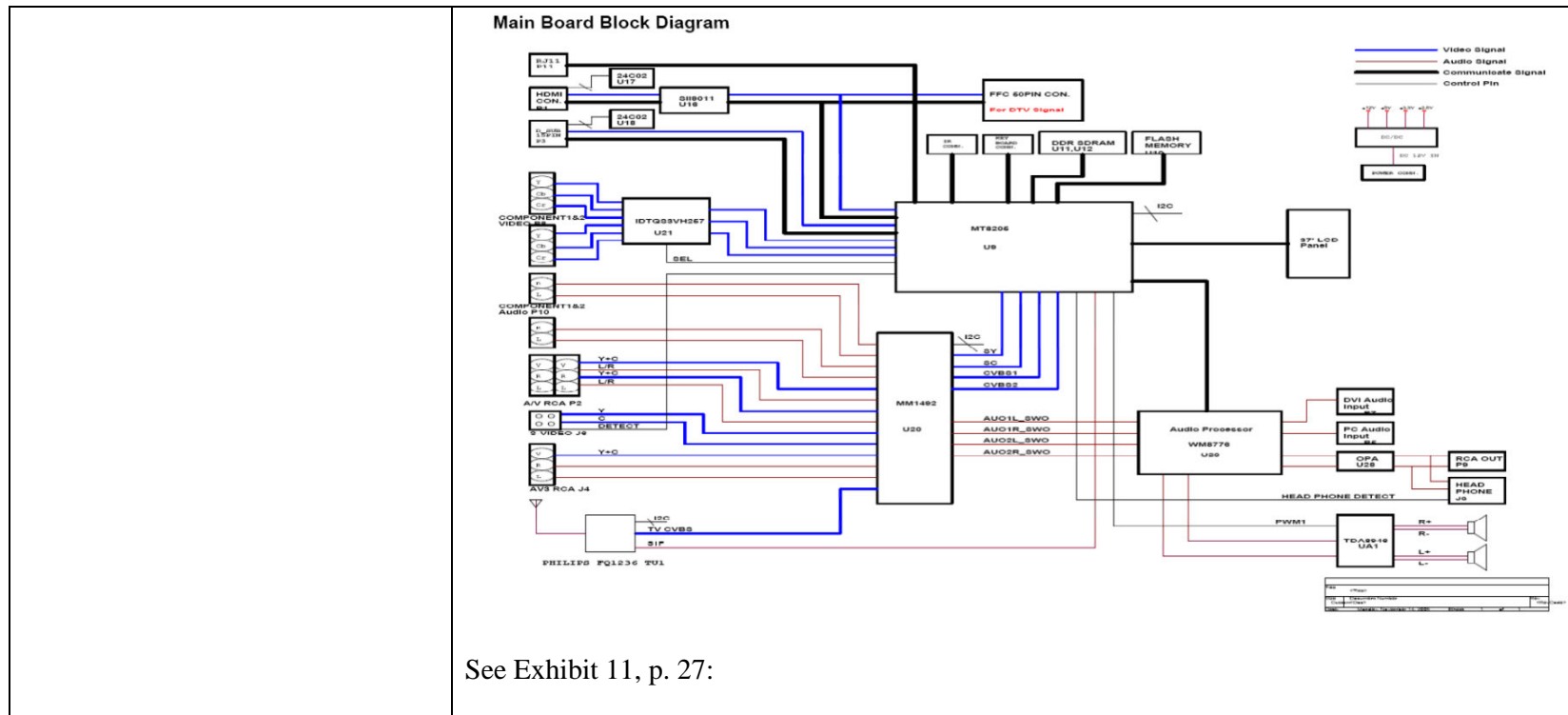|	
	See **Exhibit 10**, p. 38: **MT8205 Application** MT8205 is a highly integrated single chip for LCD TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. See **Exhibit 10**, p. 43: **b. De-interlacing** Automatic detect film or video source 3:2/2:2 pull down source detection Advanced Motion adaptive de-interlacing See **Exhibit 11**, p. 34:

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Exhibit D

A002801

Infringement Chart
U.S. Patent No. 6,239,842
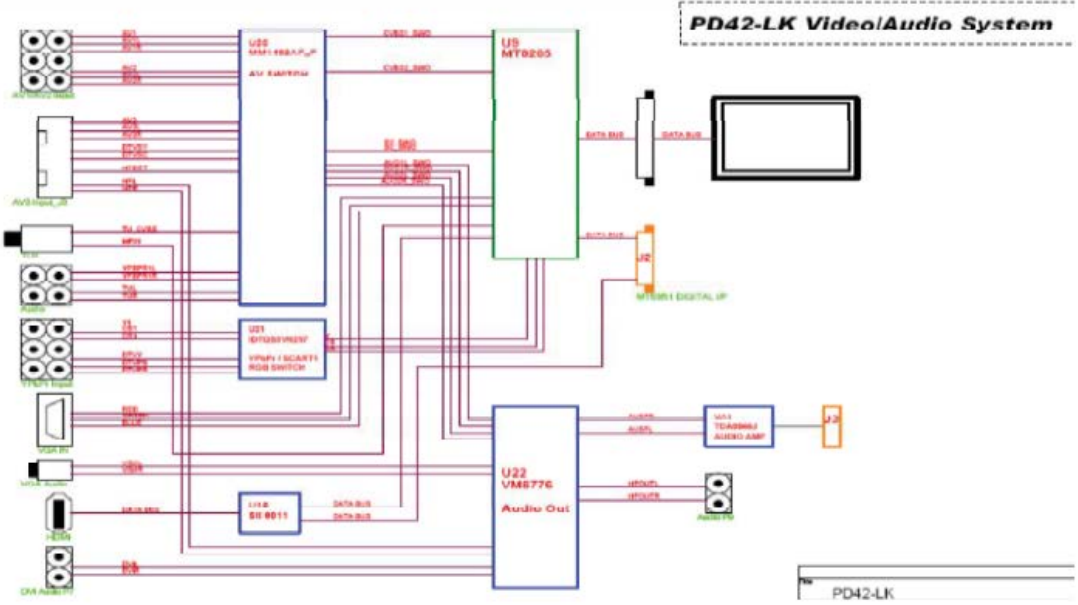**Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology**

	MT8205 Application MT8205 is a highly integrated single chip for PDP TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. Optional 2nd HDTV or SDTV inputs allows user to see multi-programs on same screen. Flexible scalar provides wide adoption to various PDP panel for different video sources. Its on-chip audio processor decodes analog signals from Tuner with lip sync control, delivering high quality post-processed sound effect to customers. On-chip microprocessor reduces the system BOM and shortens the schedule of UI design by high level C program. MT8205 is a cost-effective and high performance HDTV-ready solution to TV manufactures.
receiving the interlaced video format featuring a sequence of fields of pixels to be de-interlaced;	The interlaced video signal is received by the TV via an antenna connector and tuner and/or video connector. Interlaced video signals by definition incorporate a sequence of fields of pixels with the commonly used interlaced video signals (e.g. NTSC, 1080i) having two fields with one field containing all of the even scan lines and the other field containing all of the odd scanning lines. The fields by definition have missing scanning lines and thus missing pixels of those scanning lines. See **Exhibit 8**, p. 21:

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Infringement Chart

U.S. Patent No. 6,239,842

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	BOLOCK DIAGRAM See Exhibit 9, p. 27:

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Exhibit D

A002803

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

System Block Diagram

See Exhibit 10, p. 31:

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Exhibit D

Infringement Chart

U.S. Patent No. 6,239,842

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Main Board Block Diagram

See Exhibit 11, p. 27:

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Exhibit D

A002805

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	Main Board Block Diagram
using a current spatial field featuring missing spatial pixels and said spatial pixels with known values, located in said sequence of said pixels,…	For interlaced video signals (e.g. NTSC, 1080i) by definition the current spatial field has missing scan lines and thus missing pixels of those scan lines with the purpose of deinterlacing being to recreate (at least) those scan lines. The missing spatial pixels are (because they are missing) of unknown value in that field and the included spatial pixels of the included scan lines have known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Exhibit D

A002806

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. For purposes of understanding, the current field may be considered the field for which deinterlacing is being performed using the appropriate interpolation algorithm..
and one temporal field featuring temporal pixels with known values, located in said sequence of said fields,…	Temporal fields include the immediately previous and immediately next fields as set for the in the standards of the received video signal (e.g. NTSC, 1080i) and like the current spatial field above have pixels with known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation.
…for determining values of said missing pixels of said current spatial field;	The current spatial field and temporal field are used to determine the values of the missing pixels of the current spatial field, i.e. MDDi operates to perform deinterlacing of the current spatial field thus creating a progressive field (or frame). The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Exhibit D

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. That is, the fixed number of fields (e.g., one temporal field) are used for determining the appropriate motion algorithm which thus determines the value of the missing pixel. For purposes of understanding, the temporal field is one being used along with the current field to accomplish deinterlacing of the current field.
evaluating logical operations of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of said temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants,	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants. See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (**Exhibit 15**):

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Exhibit D

A002808

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, `and`, `or`, and `xor`; and	FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'. Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
deciding upon assignment of said values to said missing spatial pixels according to results of said logical operations.	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation or other digital logic calculations to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the

22

Exhibit D

A002809

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	deinterlaced image are avoided. Based on the logical operations, the MDDi circuit makes the assignment of the values to the missing spatial pixels according to the results thus completing the deinterlacing operation.
Claim 15	
The method of claim 14, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the MDDi circuit to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame.

23

Exhibit D

A002810

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
CIVIL MINUTES - GENERAL

CASE NO(S):   Date: June 25, 2013

LA12CV05707-MRP (Ex)   OPLUS TECHNOLOGIES, LTD. v. SEARS HOLDINGS
**   CORPORATION, ET AL.**

===
PRESENT: THE HONORABLE MARIANA R. PFAELZER, SENIOR U.S. DISTRICT JUDGE

   Isabel Martinez   Lisa Gonzalez
   Courtroom Clerk   Court Reporter

ATTORNEYS PRESENT FOR PLAINTIFFS: ATTORNEYS PRESENT FOR DEFENDANTS:

   GABRIEL OPATKEN   **CHARLES KOOLE**
   ARTHUR GASEY   **ADRIAN PRUETZ**
   PAUL C. GIBBONS
   MICHELLE FRIEND

PROCEEDINGS: TELEPHONIC STATUS CONFERENCE

    The case is called and appearances are made. Court hears from counsel. Court notes that counsel have exchanged expert reports regarding infringement and invalidity. Court informs counsel for Plaintiff Oplus Technologies, Ltd. of adequacy of amended infringement contentions submitted on June 14, 2013. The parties are free to file motions of any kind.

MINUTES FORM 11   Initials of Deputy Clerk im
CIVIL - GEN   TIME: :15

A002815

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16
                 UNITED STATES DISTRICT COURT
17   CENTRAL DISTRICT OF CALIFORNIA
18   WESTERN DIVISION
19

OPLUS TECHNOLOGIES, LTD.,	CASE NO.: CV12- 5707 MRP (Ex)
Plaintiff,	Hon. Judge Mariana R. Pfaelzer
v.	**DEFENDANT VIZIO, INC.'S NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT OF U.S. PATENT NOS. 6,239,842 AND 7,271,840**
SEARS HOLDINGS CORPORATION; VIZIO, INC.,	
Defendants.	
	DATE: September 9, 2013
	TIME: 11:00 a.m.
	PLACE: Courtroom 12

NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT

816700

A002816

1   **<u>NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT</u>**

2   PLEASE TAKE NOTICE that at 11:00 a.m. on September 9, 2013, or as soon

3   thereafter as counsel may be heard, Defendant VIZIO, Inc. ("VIZIO") will, and

4   hereby does, move this Court, the Honorable Mariana R. Pfaelzer presiding, for

5   Summary Judgment of Noninfringement of U.S. Patent Nos. 6,239,842 and

6   7,271,840.

7   This motion is based upon this Notice of Motion and Motion, the

8   accompanying Memorandum of Points and Authorities, Statement of Uncontroverted

9   Facts and Conclusions of Law, Declarations of Charles C. Koole and Dr. Sheila S.

10   Hemami in support of this Motion and exhibits thereto, all pleadings and papers on

11   file in this action, and upon such other matters as may be presented to the Court at the

12   time of the hearing.

13   In accordance with the Court's standing order and Civil Local Rules, VIZIO

14   counsel certifies that they met and conferred with Oplus Technologies, Ltd.'s

15   ("Oplus") counsel prior to filing this motion. On July 19, 2013, VIZIO counsel met

16   and conferred telephonically with Oplus counsel to discuss the grounds for this

17   Motion. Declaration of Charles C. Koole in Support of Defendant VIZIO, Inc.'s

18   Motion for Summary Judgment of Noninfringement of U.S. Patent Nos. 6,239,842

19   and 7,271,840 at ¶22.

20

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23   Dated: July 29, 2013   Respectfully submitted,

24   By: /s/ Adrian M. Pruetz__

25   Adrian M. Pruetz
                                                Charles C. Koole
26   GLASER WEIL FINK JACOBS
27   HOWARD AVCHEN & SHAPIRO LLP

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                                                1
NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT

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Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

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NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT

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16 | UNITED STATES DISTRICT COURT
| CENTRAL DISTRICT OF CALIFORNIA
17 | WESTERN DIVISION

18 | OPLUS TECHNOLOGIES, LTD.,

| CASE NO.: CV12-5707 MRP (Ex)
19 |
| Hon. Judge Mariana R. Pfaelzer
20 | Plaintiff,
| **MEMORANDUM OF POINTS AND**
21 | v. | **AUTHORITIES IN SUPPORT OF**
| **DEFENDANT VIZIO, INC.'S**
22 | | **MOTION FOR SUMMARY**
| SEARS HOLDINGS CORPORATION; | **JUDGMENT OF**
23 | VIZIO, INC., | **NONINFRINGEMENT OF U.S.**
| | **PATENT NOS. 6,329,842 AND**
24 | Defendants. | **7,271,840**
25 | | **[Confidential Version]**
26 |
| DATE: September 9, 2013
27 | | TIME: 11:00 a.m.
| PLACE: Courtroom 12
28 |

MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY
JUDGMENT OF NONINFRINGEMENT

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No one at VIZIO understands what motion adaptive deinterlacing does. UF ¶12. No one at VIZIO understands the technology behind noise reduction. UF ¶13. No one at VIZIO understands how motion adaptive noise reduction works. UF ¶14. No one at VIZIO understands how HQV technology works. UF ¶15. No one at VIZIO understands how DCDi technology works. UF ¶16. And no one at VIZIO understands how MDDi technology works. UF ¶17.

Oplus told the Court that "Vizio is not a manufacturer. It has no knowledge or involvement in design and manufacturing…. [I]t is Vizio that has no understanding of how its products were designed, developed or work." UF ¶18. Oplus told the Court that "none of the discovery to be had about the technical details of such accused products can be obtained in California." UF ¶19. Oplus told the Court that VIZIO's "[s]uppliers (all of whom are based in China and Taiwan) decide what designs to use and how to use them….Vizio doesn't select or approve the video processing circuitry, for example, which [Oplus claims] is used to practice the patents at issue." UF ¶20. And Oplus told the Court that VIZIO has "no involvement in the design of the products that it sells." UF ¶21.

Accused Instrumentalities. Oplus asserts that eighteen of VIZIO's television models infringe the Asserted Patents, both directly and indirectly, because they allegedly use certain video processing algorithms implemented in their third-party video processing chips. Oplus specifically accuses:

- Seven televisions of infringing the '840 Patent by allegedly incorporating "Faroudja DCDi technology with 3D noise reduction";

- Eight televisions of infringing the '842 Patent by allegedly incorporating "MediaTek MDDi Motion Adaptive Deinterlacing" and of infringing the '840 Patent by allegedly incorporating "MediaTek MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection"; and

- Three televisions of infringing the '842 Patent by allegedly incorporating Silicon Optix "HQV [Hollywood Quality Video] Technology"

UF ¶¶34-37. Oplus served a report from its alleged expert, D. Michael Holmes, to the

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MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT

1   same effect. Decl. of Charles C. Koole in Support of Def. VIZIO's Mot. for Summ.

2   J. of Noninfringement ("Koole Decl."), ¶11.

3   The asserted claims recite specific mathematical calculation steps for carrying

4   out deinterlacing ('842 Patent) and calculating pixel entropies to correct editing errors

5   ('840 Patent). For example, the asserted claims of the '842 Patent recite specific

6   mathematical calculation steps for carrying out deinterlacing, such as "evaluating

7   logical operations of linear combinations of values selected from the group consisting

8   of" several different quantities based on spatial and/or temporal pixel values. UF

9   ¶¶27-28. The asserted claims of the '840 Patent recite specific mathematical

10   calculation steps for calculating pixel entropies to correct editing errors, such as

11   "calculating values for pixel inter-local neighborhood parameters," "calculating a

12   value of a virtual-pixel intra-local neighborhood parameter," "adjusting a value of a

13   pixel entropy counter," and "calculating a value of the entropy." UF ¶29. VIZIO,

14   however, does not know and does not have access to the methods by which the

15   accused televisions perform deinterlacing or process video, much less know or

16   understand the specific mathematical calculations used in the video processing chips.

17   UF ¶¶2-21, 38-39. The video processing chips that Oplus contends implement the

18   allegedly infringing algorithms were manufactured by third parties who consider the

19   operation and function of the chips to be their confidential and proprietary

20   information. UF ¶39.

21   **Accused Actions**. The asserted claims are all method claims. UF ¶¶22-26. It

22   is undisputed that VIZIO was unaware of either of the Asserted Patents until after

23   Oplus filed this lawsuit on December 1, 2011. UF ¶40. While the Asserted Patents

24   can be characterized as generally concerning a method of deinterlacing (the '842

25   Patent) and a method of calculating pixel entropies to correct editing errors (the '840

26   Patent), the asserted claims focus on specific techniques for implementing these

27   methods. UF ¶¶22-32. Oplus concedes that there are multiple methods for correcting

28   errors ('840 Patent) and for deinterlacing ('842 Patent) but the asserted claims only

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    Attorneys for Defendant
14 *VIZIO, Inc.*

15   UNITED STATES DISTRICT COURT
                CENTRAL DISTRICT OF CALIFORNIA
16   WESTERN DIVISION

17 OPLUS TECHNOLOGIES, LTD.,   CASE NO.: CV12- 5707 MRP (Ex)
18
           Plaintiff,   Hon. Judge Mariana R. Pfaelzer
19
20 v.   **DECLARATION OF CHARLES C.
                                        KOOLE IN SUPPORT OF
21   DEFENDANT VIZIO, INC.'S
    SEARS HOLDINGS CORPORATION;   MOTION FOR SUMMARY
22 VIZIO, INC.,   JUDGMENT OF
                                        NONINFRINGEMENT OF U.S.
23   Defendants.   PATENT NOS. 6,239,842 AND
24   7,271,840**
25
26   DATE: September 9, 2013
                                        TIME: 11:00 a.m.
27   PLACE: Courtroom 12
28

816752.2

A002873

Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

1 Actions Pursuant to 28 U.S.C. § 1407 (Dkt. No. 20), which was filed on August 21,

2 2012 in *In re Oplus Techs., Ltd. Patent Litigation*, Case No. 2400 (J.P.M.L.).

3   9.   Attached hereto as Exhibit 8 is a true and correct copy of relevant

4 excerpts of Oplus' Response to VIZIO's First Set of Interrogatories (1-15), which was

5 served on September 10, 2012.

6   10.   Attached hereto as Exhibit 9 is a true and correct copy of relevant

7 excerpts of the transcript from the February 27, 2013 hearing regarding VIZIO's

8 Motion for Summary Judgment of Invalidity Under 35 U.S.C. §§ 101 and 112.

9   11.   Attached hereto as Exhibit 10 is a true and correct copy of the Expert

10 Report and Declaration of D. Michael Holmes, which was served on June 12, 2013.

11   12.   Attached hereto as Exhibit 11 are true and correct copies of the two

12 websites cited by Oplus in its Amended Infringement Contentions regarding VIZIO's

13 alleged use of the accused televisions: http://cnettv.cnet.com/vizio-vp504f/9742-

14 1_53-31953.html; and http://www.businesswire.com/news/home/20080107005370/

15 en/Eleven-Products-CES-2008-Feature-Silicon-Optix.

16   13.   Attached hereto as Exhibit 12 is a true and correct copy of relevant

17 excerpts of the Expert Report of J. Carl Cooper, which was served on July 10, 2013.

18   14.   Attached hereto as Exhibit 13 is a true and correct copy of relevant

19 excerpts of the Declaration of Richard Ferraro in Support of Plaintiff's Response to

20 Defendant's Motion for Summary Judgment of Invalidity (Dkt. No. 108-10), which

21 was filed on February 4, 2013.

22   15.   Attached hereto as Exhibit 14 is a true and correct copy of relevant

23 excerpts of the March 4, 2013 Order Denying VIZIO's Motion for Summary

24 Judgment of Invalidity Under 35 U.S.C. §§ 101 and 112, ¶ 2 (Dkt. No. 113).

25   16.   Attached hereto as Exhibit 15 is a true and correct copy of relevant

26 excerpts of VIZIO's Answer to Plaintiff's First Amended Complaint and Affirmative

27 Defenses (Dkt. No. 16), which was filed on February 16, 2012.

28

DECLARATION OF CHARLES C. KOOLE ISO VIZIO'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT

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Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

Vizio has infringed claims 56, 57, 58, 59, and 62 of U.S. Patent No. 7,271,840 ("the '840 patent") within the meaning of 35 U.S.C. 271(a) by using televisions incorporating MediaTek MDDIi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection, including at least Vizio's L42HDTV10A, GV42L, VW46L, FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820Xvideo signal processing chips with MDDi).

As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

On information and belief, many more Vizio televisions than those listed above incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection. Oplus thus reserves the right to add additional claims and/or products.

This chart refers to service manuals for the representative Vizio TVs, e.g. VW46L FDDTV10A service manual PDF pages 25-29, (**Exhibit 9**); L42HDTV10A/GV42L service manual PDF pages 20-26, 50, (**Exhibit 8**); L37HDTV service manual PDF pages 30-32, 37-43, (**Exhibit 10**); P42HDTV10A service manual PDF pages 25-28, 33-34, (**Exhibit 11**). The service manual for Vizio's VX32L and VW32L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf
The service manual for the VX37L televisionsis available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and
http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

Claim Element	Infringement by Vizio Televisions or Displays Incorporating MDDi Motion Adaptive Deinterlacing Technology with 3:2 Pulldown Detection
56. A method determining entropy of a pixel of a real time streaming digital video image signal,	Vizio TVs which utilize MediaTek MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection (hereinafter "MDDi") operate so as to determine the entropy of a pixel of a real time streaming digital video image signal (e.g. a recorded or broadcast digital television signal). Specifically, MDDi utilizes 3:2 deinterlacing. In 3:2 deinterlacing, in order to determine if a

Exhibit B

A002941

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	given pixel belongs to one field or another, i.e. to determine which field or frame it is related to, it is necessary to determine its entropy. This must be done in real time in order for the Vizio TV to display real time video programs. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57 Vizio products operate with a real time streaming digital video image signal, commonly referred to as a video signal. In deinterlacing, noise reduction and resolution enhancement operations it is necessary to determine pixel entropy in order to properly determine which of the neighboring pixels (in time and space) a particular pixel is related to in order to properly perform these and other features to prevent, or at least greatly reduce, errors or noise in the image.
for automatically correcting an error produced during real time editing of the real time streaming digital video image input signal,	The video signal utilized by the Vizio products include movies which are originated on film and converted from film to video utilizing 3:2 pulldown conversion which produces a 3:2 cadence in the video signal. The video signals are often edited without reference to the 3:2 pulldown cadence thus creating errors in the cadence. Vizio's televisions perform error correction in real time which must, by nature, be automatic. See Ex. 8, pp. 21, 26, 50, 52; Ex. 9 , pp. 26, 29, Ex. 10, pp. 38, 43, 59, 61; Ex. 11, pp. 34, 39, 55, 57
comprising the steps of: receiving and characterizing the streaming digital video image input signal during a pre-determined time interval;	The streaming digital video image input signal (i.e. the digital TV input signal) is received by the Vizio televisions during a predetermined time interval. Specifically, the 3:2 deinterlacing performed by MDDi uses a predetermined time interval comprising 3 consecutive fields. Among other features of the Mediatek chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. The Motion Adaptive Noise Reduction must utilize a temporal filtering system because it must read and recognize movement, which is impossible without considering multiple frames or fields across a pre-determined time interval. In particular it is necessary to first characterize the input video signal as a particular progressive or interlaced format signal since there is no need to deinterlace a progressive signal (although a progressive signal may have been previously deinterlaced and may contain cadence error related errors which resulted from the previous deinterlacing and that progressive signal may also be subsequently converted to an interlaced signal).

Exhibit B

A002942

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. MediatTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (Ex. 16) Please note that, in considering the issue of infringement, the issue of an accused infringer's patent corresponding to its infringing product "warrants consideration by the trier of fact, along with the other evidence of the differences and similarities of the patented and accused devices[.]" *National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185 , 1191 –92 (Fed. Cir. 1996). While Mediatek admittedly has many patents, its descriptions in the available literature to its patent-pending MDDi "de-interlacing" solution (with some Mediatek references to such technology going back to the 2003 time frame) drastically narrows the list. Specifically, per Lexis, only 5 issued US patents assigned to Mediatek were filed in 2003 or earlier which use the word "de-interlacing." See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57
assigning and characterizing a local neighborhood of neighboring pixels to each input image pixel of the streaming digital video image input signal, in a temporal interlaced sequence of three consecutive fields in a global input grid of pixels	The streaming digital video image input signal received by the Vizio televisions contains pixels. MDDi 3:2 deinterlacing requires 3 fields commonly referred to in the art as the current, previous, and next fields. MDDi operates to assign and characterize a local neighborhood of neighboring pixels for each input image pixel of an image in a temporal interlace sequence of the three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal.

Exhibit B

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

included in the streaming digital video input image signal, said three consecutive fields being a previous field, a next field, and a current field; and	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. E.g., Mediatek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**) See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57.
determining the entropy of each virtual pixel, of each previous pixel, and of each next pixel, in said temporal interlaced sequence of said three consecutive fields, relative to said assigned and characterized local neighborhoods of said neighboring pixels, said determining comprising the steps of:	This element requires the pixels of the temporal fields to be compared to detect pixels affected by noise, which is a form of video error that is based on the entropy of the data. The noise can for example result from a cadence error which results in moving (e.g. from different film frame) pixels being placed in the wrong temporal sequence. For purposes of explanation, a pixel which is temporally out of place will have a large difference as compared to its temporally neighboring pixels and thus a high entropy or randomness, which pixel may be considered to be noisy. In order to perform 3:2 deinterlacing, MDDI must determine the entropy of each virtual pixel and the previous and next pixel from the previous and next fields in order to know or estimate which of those pixels are obtained from or belong to the same input image frame. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57. This necessarily requires the following steps, as set forth below.
calculating values of pixel inter-local neighborhood parameters for each said previous pixel in said previous field, and for each said next pixel in	This element is the first step of the above "comprising" element, where the selected area of (i.e. inter-local neighborhood) the fields are compared, detecting the changes that occur between each and to create a weighted change between each. For purposes of understanding, the changes may be considered to be inter-local noise or randomness which may result, for

Exhibit B

A002944

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Vizio has infringed claims 7, 8, 9, 14, and 15 of U.S. Patent No. 6,239,842 ("the '842 patent") within the meaning of 35 U.S.C. 271(a) by using televisions or displays incorporating MediaTek MDDi Motion Adaptive Deinterlacing technology, including at least Vizio's L42HDTV10A, GV42L, VW46L FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820X video signal processing chips with MDDi).

As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions.

On information and belief, many more Vizio televisions than those listed above incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing technology. Oplus reseves the right to add additional claims and/or products.

This chart refers to service manuals for the representative Vizio TVs, e.g. VW46L FHDTV10A service manual PDF pages 25-29, **(Exhibit 9)**; L42HDTV10A/GV42L service manual PDF pages 20-26, 50, **(Exhibit 8)**; L37HDTV service manual PDF pages 30-32, 37-43 **(Exhibit 10),** P42HDTV10A service manual PDF pages 25-28, 33-34, **(Exhibit 11)**. The service manual for Vizio's VX32L and VW32L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf
The service manual for the VX37L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

Evidence of Vizio's use of the accused television models can be found within the deposition of Ken Lowe (May 10, 2013); as well as at the following links: http://cnettv.cnet.com/vizio-vp504f/9742-1_53-31953.html; and
http://www.businesswire.com/news/home/20080107005370/en/Eleven-Products-CES-2008-Feature-Silicon-Optix

Claim	Infringement by Vizio Televisions Incorporating MDDi
Claim 7	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with MDDi use that technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal. All Vizio flat panel (e.g. HDTV) televisions must deinterlace received interlaced video signal

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Exhibit D

A002964

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	Main Board Block Diagram PD42-LK Video/Audio System
(b) evaluating logical operations of linear combinations of values selected from the group consisting of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels,	This element requires that the missing pixels, that is the spatial pixels which are missing from an interlaced video field, are identified through averaging, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels. For example, the values of the missing pixels will be determined using the values of existing spatial pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image.

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Exhibit D

A002971

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor'; and	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants.

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Exhibit D

A002972

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (**Exhibit 15**):

FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'.

Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation

Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations.

Please note that, in considering the issue of infringement, the issue of an accused infringer's patent corresponding to its infringing product "warrants consideration by the trier of fact, along with the other evidence of the differences and similarities of the patented and accused devices[.]" *National Presto Industries, Inc. v. West Bend Co.*, 76 F.3d 1185 , 1191 –92 (Fed. Cir. 1996). While Mediatek admittedly has many patents, its descriptions in the available literature to its patent-pending MDDi "de-interlacing" solution (with some Mediatek references to such technology going back to the 2003 time frame) drastically narrows the list. Specifically, per Lexis, only 5 issued US patents assigned to Mediatek were filed in 2003 or earlier which use the word "de-interlacing."

The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic

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Exhibit D

A002973

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
(c) deciding upon assignment of values to missing spatial pixels according to results of said logical operations	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images artifacts in the deinterlaced image are avoided. Based on the logical operations, the MDDi circuit makes the assignment of the values to the missing spatial pixels according to the results thus completing the deinterlacing operation.
Claim 8	
The method of claim 7 , wherein said sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of aid fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields.	Because the interlaced video signals which the Vizio televisions with MDDi deinterlacing all meet video standards (e.g. NTSC, 1080i HDTV) the sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels (i.e. the missing pixels of the missing scan lines of video) and spatial pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values) and at least one temporal field (e.g. the immediately previous or immediately past field) with temporal pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values).
Claim 9	

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Exhibit D

A002974

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	Main Board Block Diagram PD42-LK Video/Audio System (block diagram)
using a current spatial field featuring missing spatial pixels and said spatial pixels with known values, located in said sequence of said pixels,…	For interlaced video signals (e.g. NTSC, 1080i) by definition the current spatial field has missing scan lines and thus missing pixels of those scan lines with the purpose of deinterlacing being to recreate (at least) those scan lines. The missing spatial pixels are (because they are missing) of unknown value in that field and the included spatial pixels of the included scan lines have known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Exhibit D

A002982

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. For purposes of understanding, the current field may be considered the field for which deinterlacing is being performed using the appropriate interpolation algorithm..
and one temporal field featuring temporal pixels with known values, located in said sequence of said fields,…	Temporal fields include the immediately previous and immediately next fields as set for the in the standards of the received video signal (e.g. NTSC, 1080i) and like the current spatial field above have pixels with known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation.
…for determining values of said missing pixels of said current spatial field;	The current spatial field and temporal field are used to determine the values of the missing pixels of the current spatial field, i.e. MDDi operates to perform deinterlacing of the current spatial field thus creating a progressive field (or frame). The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Exhibit D

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. That is, the fixed number of fields (e.g., one temporal field) are used for determining the appropriate motion algorithm which thus determines the value of the missing pixel. For purposes of understanding, the temporal field is one being used along with the current field to accomplish deinterlacing of the current field.
evaluating logical operations of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of said temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants,	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants. See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (**Exhibit 15**):

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Exhibit D

A002984

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, `and`, `or`, and `xor`; and	FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'. Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
deciding upon assignment of said values to said missing spatial pixels according to results of said logical operations.	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation or other digital logic calculations to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the

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Exhibit D

A002985

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD.,   )
)
                Plaintiff,   )
)
    vs.   ) Case No. CV12-5707 MRP(E)
)
SEARS HOLDINGS CORPORATION   )
and VIZIO, INC.,   )
)
                Defendants.   )
_____)

CONFIDENTIAL - ATTORNEYS' EYES ONLY

VIDEOTAPED 30(B)(6) DEPOSITION of VIZIO,
INC. (KENNETH ROY LOWE), taken on behalf of
Oplus Technologies, Ltd., at 18000 Von Karman
Avenue, Irvine, California, commencing at
9:32 a.m., Friday, May 10, 2013, before
Michelle Hutton, C.S.R. 7322.

```
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Attorneys for Plaintiff
Oplus Technologies, Ltd.

IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707 MRP (E)
Plaintiff,	*Assigned to the Honorable Mariana R. Pfaelzer*
v.	
SEARS HOLDINGS CORPORATION and VIZIO, INC.,	**PLAINTIFF'S RESPONSE TO DEFENDANT'S FIRST SET OF INTERROGATORIES (1-15)**
Defendants.	**JURY TRIAL DEMANDED**

PLAINTIFF'S RESPONSE TO DEFENDANT'S FIRST SET
OF INTERROGATORIES (1-15) – CASE NO. CV12-5707-MRP (E)

A003046

1   Intel) developed specifications for a product known as the Rembrandt-102 (See, e.g., Rembrandt-

2   102 data sheet, OPLUS000486-OPLUS000565), which identifies the existence of an Oplus

3   Technologies, Ltd. (Israel) video decoder product known as the Matisse-1A. If and when Oplus

4   obtains information about the structure and function of such product(s) sufficient to determine

5   whether such product(s) practice the asserted claims, Oplus reserves the right to supplement this

6   response in accord with Fed. R. Civ. P. 26(e).

7   **INTERROGATORY NO. 9:**

8   State specifically the portions of the respective specifications for the Asserted Patents that
describe, depict, or otherwise support each asserted claim limitation of the Asserted Patents.

9   Response to this Interrogatory should include a citation to the column number and the line
numbers of the specification of the Asserted Patents.

10   **RESPONSE:**

11   See General Objection No. 6. Oplus objects to this interrogatory as premature, as the

12   Court has ordered that the identification of terms to be construed (much less the identification of

13   citations to the specification supporting such construction) is not even due until October 1, 2012

14   (See D.I. 86).

15   Subject to the foregoing specific and General Objections, Oplus responds as follows:

16   Oplus will provide its preliminary contentions on October 15, 2012, in accord with that Order,

17   and will supplement this response accordingly, in compliance with Fed. R. Civ. P. 26e.

18   **INTERROGATORY NO. 10:**

19   State the date and manner that you contend that VIZIO was given notice of the alleged
infringement of each of the Asserted Patents, identifying all relevant documents and persons with

20   knowledge.

21   **RESPONSE:**

22   Oplus objects to this interrogatory insofar as it seeks to argue that notice was required to

23   obtain damages pursuant to 35 U.S.C. § 287. In fact, the infringed claims are method claims, and

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"[t]he law is clear that the notice provisions of § 287 do not apply where the patent is directed to a process or method." Fujitsu Ltd. v. Netgear Inc., 620 F.3d 1321, 1332 (Fed. Cir. 2010) (quoting Crown Packaging Tech., Inc. v. Rexam Beverage Can Co., 559 F.3d 1308, 1316 (Fed. Cir. 2009)); see also Crystal Semiconductor Corp. v. TriTech Microelectronics Int'l, Inc., 246 F.3d 1336, 1353 (Fed. Cir. 2001) ("Because the [asserted] patent only claims methods, the notice provisions of § 287(a) do not apply to it."); Am. Med. Sys., Inc. v. Med. Eng'g Corp., 6 F.3d 1523, 1538 (Fed. Cir. 1993); Hanson v. Alpine Valley Ski Area, Inc., 718 F.2d 1075, 1083 (Fed. Cir. 1983) ("It is `settled in the case law that the notice requirement of [§ 287(a)] does not apply where the patent is directed to a process or method.'" (quoting Bandag, Inc. v. Gerrard Tire Co., 704 F.2d 1578, 1581 (Fed. Cir. 1983))).

Subject to the foregoing specific and General Objections, Oplus responds as follows: Notice was given at least as of December, 2011 (see Document Control No. 1). Oplus reserves the right to supplement this response pursuant to Fed. R. Civ. P. 26(e), as Oplus does not have knowledge of notice which may have been given through prior corporate parents controlling Oplus (e.g., Intel).

INTERROGATORY NO. 11:

For each of the Asserted Patents, identify all current or former employees or agents (including but not limited to outside counsel, advisors, and consultants) of any assignee of an Asserted Patent who were aware of the contents, either in whole or in part, of an Asserted Patent while it was pending as an application, or any continuation, divisional, or continuation-in-part applications thereof, and for each person describe the substance of his or her knowledge and the circumstances under which that knowledge was first obtained, identifying all relevant documents and persons with knowledge.

RESPONSE:

See General Objection No. 1. Oplus objects to this request insofar as it seeks knowledge and/or communications which are covered by the work product doctrine and/or the attorney

-13-

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11 **Oplus Technologies, Ltd.**

12   IN THE UNITED STATES DISTRICT COURT
              FOR THE CENTRAL DISTRICT OF CALIFORNIA
13   WESTERN DIVISION

14

15 OPLUS TECHNOLOGIES, LTD., | Case No. CV12-5707 MRP (E)

                          Plaintiff, | *Assigned to the Honorable Mariana R.*
16 | *Pfaelzer*
        v.
17 | **EXPERT REPORT AND**
    SEARS HOLDINGS CORPORATION | **DECLARATION OF D. MICHAEL**
18 and VIZIO, INC., | **HOLMES**

19   Defendants.

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A003061

I.   INTRODUCTION

1.   My name is D. Michael Holmes. I am currently employed as the President and Owner of Holmes Technologies LLC, which performs technical consulting, among other functions. I have been hired by the Plaintiff's lawyers in this case as a technical consultant and expert regarding U.S. Patent Nos. 7,271,840 (the "'840 patent") and 6,239,842 (the "'842 patent") as used by certain Vizio products.

2.   A brief summary of my background and experience is provided in my Curriculum Vitae, including a list of all publications which I have authored in the past 10 years and a complete listing of the trials and depositions in which I have testified in the last four years is attached as Exhibit A. I am being compensated at a rate of $375 per hour in this matter.

3.   I currently have formed opinions in my capacity as a technical consultant and expert that the '840 and '842 patents are in fact infringed by various Vizio products.

4.   The materials I considered in forming my opinions are those documents referenced throughout the body of this report as well as those referenced in the claim charts attached as Exhibits to this report. I have also examined and performed testing on the following models of VIZIO televisions: GV46L HDTV, L37 HDTV, and the P42HDTV10A.

The Vizio televisions and displays that use the Silicon Optix Reon chip

a.   These products infringe claims 7-9 and 14-15 of the '842 patent through the use of "Hollywood Quality Video"

-2-

(HQV) video enhancement algorithms, particularly through the use of pixel-based motion-adaptive de-interlacing, and the use of a multi-directional diagonal filter (MDDF).

The Vizio televisions and displays that use the Genesis Microsystems video processor chips Genesis Cortez (FLI8532), Genesis Hudson, and Genesis Cortez Advanced (FLI8668)

    b.   These products infringe claims 56-59 and 62 of the '840 patent through the use of "Directional Correlation De-interlacing" (DCDi) video enhancement processes.

The Vizio televisions and displays that use the MediaTek families of video processor chips including the MT82xx family (including the MT8202), the MT5351, the MT537x family, the MT538x family, and the MT539x family

    c.   These products infringe claims 7-9 and 14-15 of the '842 patent the use of motion-adaptive de-interlacing (MDDi) and claims 56-59 and 62 of the '840 patent through the use of MDDi with 3:2 Pull Down Detection.

    5.   What follows is a summary of the opinions that I have formed to date, based upon the documents that I have reviewed. More detailed analysis of the design of the Vizio televisions with the HQV, DCDi, and MDDi chips can be found in the claim charts attached as Exhibits B, C, D, and E, which compare the accused Vizio products to the asserted claims. As of my writing this expert report, I am unaware of any technical documents produced by Vizio or any other third party. When such documents are made available to me, I expect I will supplement any report to reflect this additional information.

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II.   THE '840 AND 842 PATENTS

A.   Background of the Technology

1.   De-interlacing

6.   Images are typically scanned for viewing on a television or other display in one of two ways, either "progressive" or "interlaced," i.e.:

1st field: Odd field   2nd field: Even field   One complete frame using interlaced scanning

Or:

One complete frame using progressive scanning
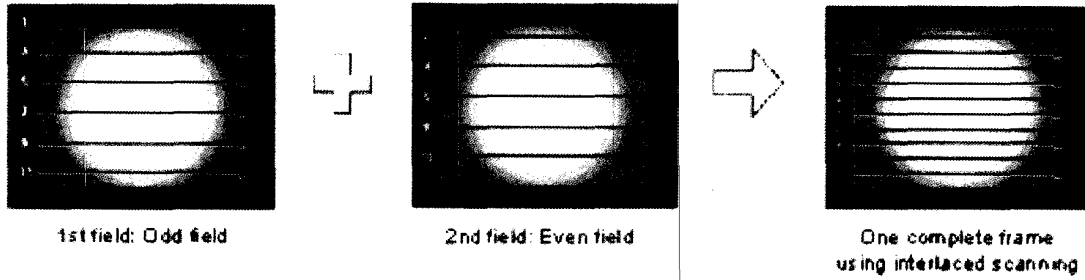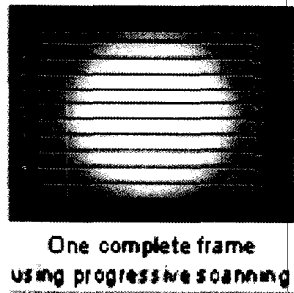
7.   Interlaced signals are typically divided into two fields which make up a complete picture, with one field comprising the "odd" numbered lines, and the other field involving the "even" numbered lines, e.g.:

-4-
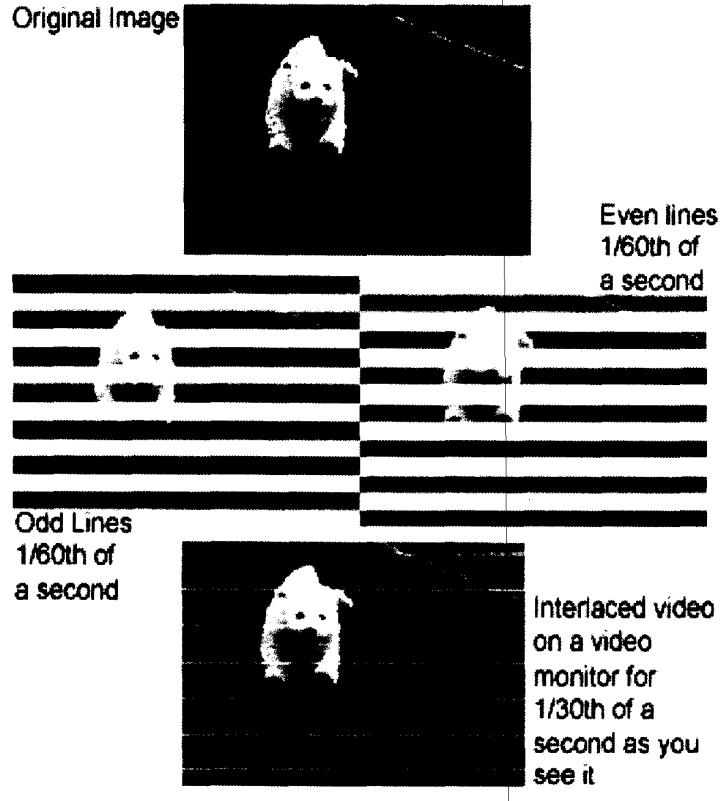
8.   The evolution of HDTV screens, many digital broadcast standards, as well as Blu-ray discs and some downloadable videos from the Internet, has resulted in a shift toward "progressive" frames instead of "interlaced." In fact, both plasma and LCD panels require a progressive video signal. Thus, any form of interlaced signal must be converted before it can be sent to the display panel. In a progressive video frame, the raster scan fills in all the lines of the image in order, not skipping over the even or odd rows, and then repeats the entire scan in the next frame. A "1080p" display, for example, displays a new 1920 by 1080 pixel frame 24 to 60 times a second. That is, a frame or complete picture for that screen includes 1920 pixels in width, and 1080 vertical rows of pixels. A "720p" display, by comparison, displays a new 1280 by 720 frame at 24 to 60 frames per second:

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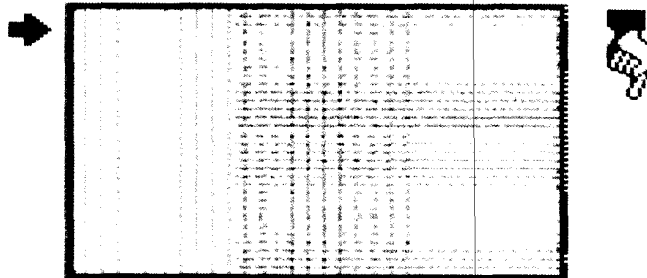
9. De-interlacing involves the process of converting an interlaced format video signal into a progressive scan video signal. One problem, however, is in accounting for motion in the image. That is, one cannot simply always delay a field for insertion and combination with its complimentary field, e.g., simply always doubling the lines in a spatial field will cause errors ("jaggies") or a staircase in the edges of moving objects, as shown in the example below:
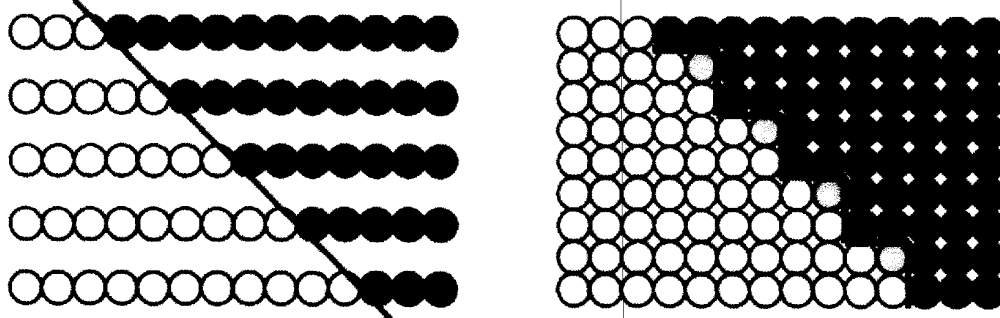
10. By contrast, simply always combining odd and even lines causes "feathering" artifacts due to time differences between odd and even scan lines, as shown in the example image below:

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	Odd field	**Even field**	**Odd + Even**
No motion			
Motion			
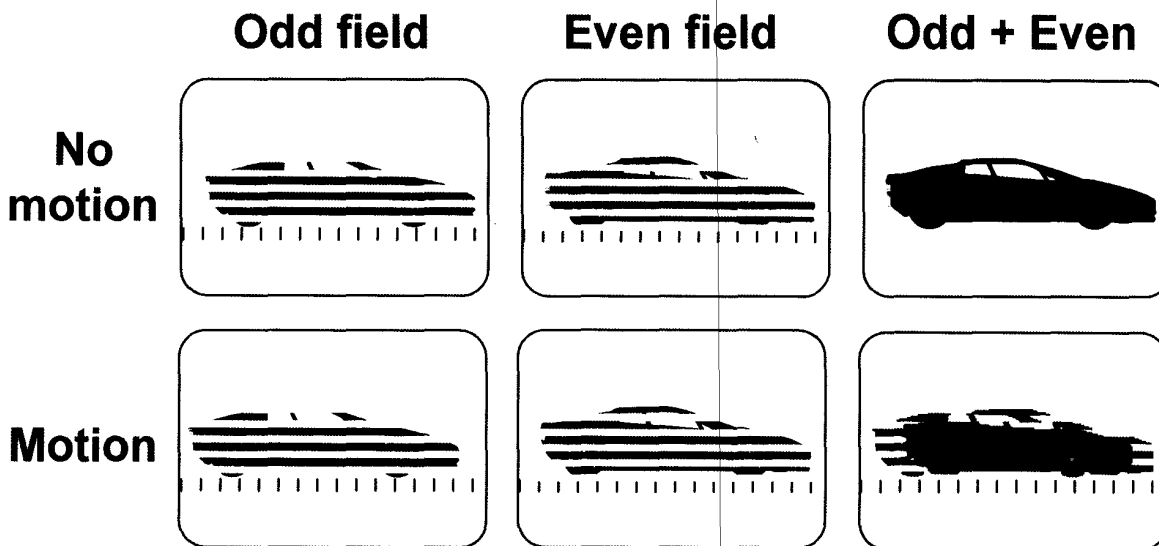
11. A further problem arises in terms of the variations of the sources of the images. Put another way, not every video source will be shot in the same format (whether interlaced or progressive) as the native resolution of the television, and many sources (e.g., movies) were shot originally for big screen film. As a result, such sources may not even have the same frame rate (i.e., the same number of pictures per second) as that used in television displays.

12. To convert such sources for television display, a film-to-video process is used to convert the film source to a desired interlaced video format. Part of this process includes converting the number of frames per second from the film standard (i.e., 24 frames per second) into the NTSC standard. This process is shown by example below:

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From movie frame 1 | From movie frame 2 | From movie frame 3 | From movie frame 4
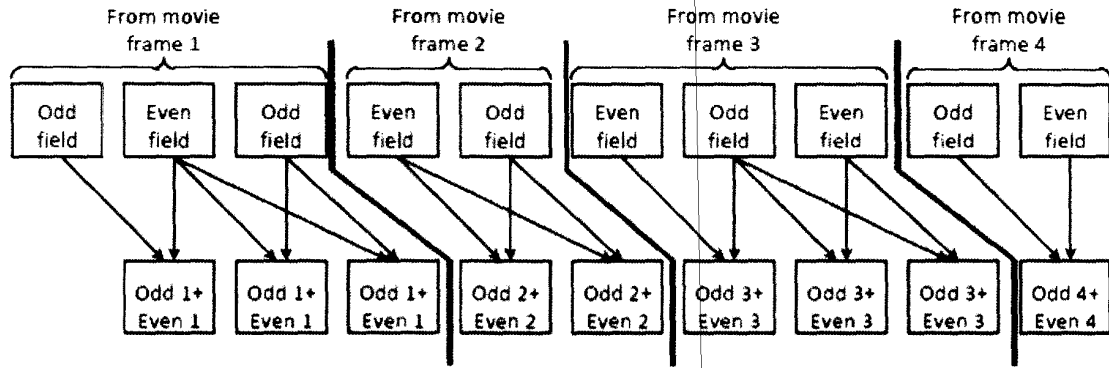
Specifically, one movie frame is mapped into 3 video fields, the next frame into 2 fields, then the next frame into 3 fields, then 2 fields, etc.; this is referred to as "3:2 Pull Down."

13.   In practice, no editing process is perfect resulting in a need to detect and compensate for bad editing in the conversion from film to video. As shown in the example below, the editing process might have used the incorrect cadence or sequencing for a given set of images in the conversion process:
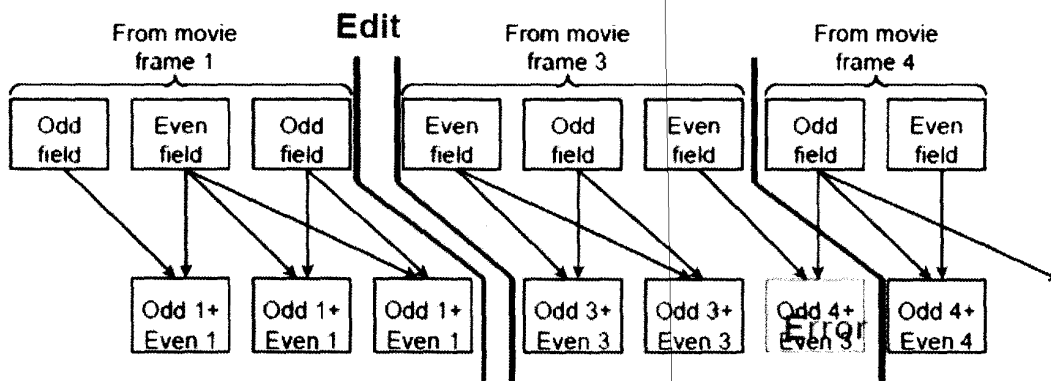
14.   With these problems as context, the solutions provided by the '842 and '840 patents may be better understood.

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2. The '842 Patent

15. The '842 patent is directed to de-interlacing. In the context of a video system, a de-interlacer may be involved in the editing process prior to broadcast or distribution (the so-called "front end") or as in the present case, de-interlacing may be integral to the display device (or "back end") such as a television.

16. As set forth in its claims, the '842 patent addresses feathering artifacts, jaggies and other de-interlacing errors as summarized above by a method of de-interlacing interlaced video signals using a mixed mode spatial and temporal approximation techniques. ('842 patent 3:44-46). Specifically, the '842 patent employs logical operations from a variety of techniques including the use of averages of known values of spatial pixels, averages of known values of temporal pixels, and other processes as defined in the claims. These techniques enable a better assignment for filling in "missing" or virtual pixel values in the process of generating a progressive image for display.

3. The '840 Patent

17. The '840 Patent is directed to entropy processing. ('840 Patent, 1:15-18.) Entropy is defined in the '840 patent as a degree or extent of randomness or disorder. In application, a typical method involves processing the kinds of entropy resulting from editing errors, synchronization errors (such as the cadence errors discussed above) and the like.

18. The '840 Patent describes synchronization errors interjected into the video signals during the front end editing process. More specifically, in order to output an interlaced signal, the front end processing can interject errors into the

-9-

1 front end's output interlaced video signal, such as in the film conversion process

2 referenced above. The back end stage can correct the editing errors in the video

3 signal when preparing the data for display.

4   19.   The '840 Patent discloses a technique for error correction using

5 entropy processing. This entropy process is used to identify the origin of the input

6 video signals and to correct these editing errors. ('840 Patent, 4:56-60). In

7 particular, since television stations are increasingly broadcasting various mixes of

8 video image signals acquired from a variety of video camera sources (e.g.,

9 interlaced video, non-interlaced or progressive video, non-interlaced Hollywood

10 movie film, and non-interlaced computer graphics), the '840 patent meets a need

11 for the real time identification of the original mode or type of camera source of a

12 digital video image signal, in order to better identify and account for editing errors

13 (such as cadence errors), thus better converting the broadcast digital video image

14 signals into the display format of the television or similar display device ('840

15 Patent, 4:33-52).

16   20.   With this background in mind, I have analyzed the physical products

17 and/or materials (e.g., service manuals) describing various Vizio products as they

18 relate to the patents in suit.

19   **B.   Infringement by Vizio Products Using HQV Enabled Chips**

20   21.   It is my opinion that certain Vizio televisions use chips from Silicon

21 Optix (now Qualcomm) to handle video processing and enhancement as part of

22 their routine functions. Based upon publicly available information that I have

23 reviewed, it is my opinion that such chips use the HQV ("Hollywood Quality

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1   Video") technology. An example of such chips and technology as used in Vizio's

2   televisions may be found in Vizio's VP505XVT and VP504F televisions (see, e.g.,

3   http://store.vizio.com/documents/downloads/hdtv/VP505XVT/198Manual.pdf at p.

4   68,   referring   to   "HQV   video   quality";   see   also

5   http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf).

6   Those   sets   use   Silicon   Optix's   Reon   VX   200   (see,   e.g.,

7   http://www.allquests.com/question/1635537-3/Vizios-New-2008-Lineup.html),

8   and those chips employ HQV, which include (per the Reon data sheet, available at

9   siliconoptixlive.dimentians.com/.../dspDocumentDownload.cfm?PCVID...)   a

10   motion adaptive de-interlacer including multi-directional diagonal filter:

-11-

Rather than discarding half the resolution of high-definition (HD) images, as today's image processors typically do, HQV technology uses the full four-field processing window for HD video deinterlacing and cadence detection, thus preserving the rich details in HD imagery.

A true 10-bit diagonal interpolator that removes any "jaggies" and/or stair-stepping artifacts from de-interlaced video sources, without blurring the image.

A fully automatic per-pixel adaptive software algorithm that adds a fourth dimension of pixel-by-pixel noise and motion measurement, detecting and reducing the analog and MPEG noise that currently plagues DVD and broadcast sources.

22.   The claim chart of Exhibit B shows the basis for my opinion that various HQV enabled Silicon Optix chips families are used by Vizio infringe the '842 patent. However, I will describe a summary of the analysis supporting my conclusion below:

23.   Jed Deame is a co-founder and General Manager of Teranex/SiliconOptix who wrote a series of articles describing HQV processing. Mr. Deame's articles provide a series of images which show the results of the logical operations performed by HQV. For instance, one of Mr. Deame's articles (available   at http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_

-12-

for_Reon.pdf) shows an image with "missing pixels" (shown by the grey pixel areas) being processed:
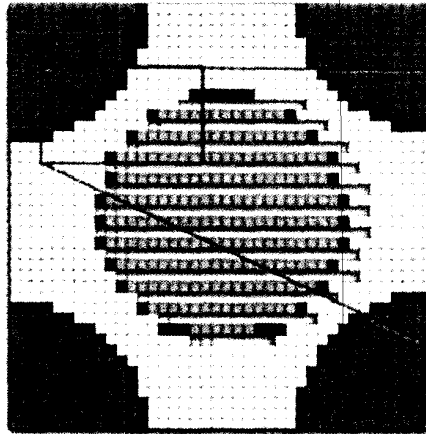
24.   The sequential images providing analysis of the detail within the red box of the image are further provided:
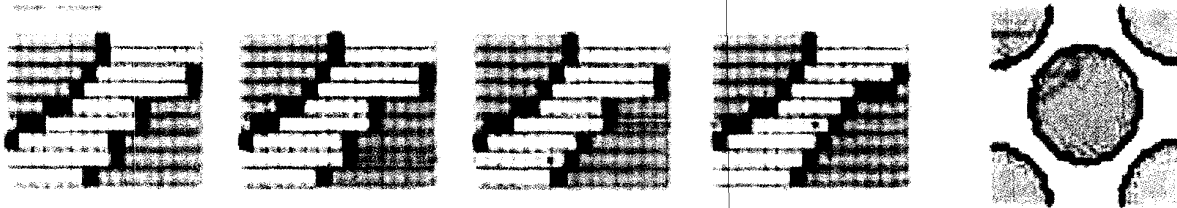
25.   The images (identified by Silicon Optix as a so-called second stage diagonal interpolation) uses logic to replace the value of the input virtual pixel to provide a averaging of spatial pixels having known values (e.g., the diagonally adjacent pixels shown above) to retain better image detail in the generation of the progressive image for display. Thus, based upon this evidence (as explained more fully in the claim chart of Exhibit B), I conclude that Vizio televisions using HQV enabled Reon processors infringe claims 7-9 and 14-15 of the '842 patent.

C.   Infringement by Vizio Products Using DCDi Enabled Chips

26.   It is my opinion that certain Vizio televisions use Genesis chips to handle video processing and enhancement as part of their routine functions. Based upon publicly available information that I have reviewed, it is my opinion that such chips use the Genesis/Faroudja DCDi technology. An example of such chips and technology as used in Vizio's televisions may be found in the service manual for the Vizio P50 HDM television (which uses the Genesis FLI 8532 chip) at http://nationalservicealliance.com/visio/VIZIO-P50HDM.pdf. As   this   manual shows (at p. 8-2), this chip includes DCDi Cinema functionality, which detects and processes any input format:

The operation of Video Processor FLI8532

> The Genesis Microchip FLI8532 includes an integrated 3-D Digital Video Decoder with Faroudja DCDi CinemaTM video format conversion, video enhancement, and noise reduction.

> The auto-detection and Faroudja DCDi CinemaTM technology allow the FLI8532 to detect, process, and enhance any video or PC graphic format. The FLI8532 supports many worldwide VBI standards for applications of Teletext, Closed Captioning, V-Chip, and other VBI technologies.

27.   Likewise,   the   service   manual   for   the   Vizio   VP50HDTV10A television,   available   at http://76.254.74.102/Updated%20Field%20Tech%20Service%20Manuals/Vizio% 20Amtran%20Field%20Tech%20Service%20Manuals/VP%20series/VP50%20HD TV10A%20Service%20Manual.pdf shows (at p. 9-2) a Genesis Cortez chip (FLI8532):

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As the FLI 8532 chip data sheet shows (see http://www.datasheet.co.kr/datasheet-html/F/L/I/FLI8532_GenesisMicrochip.pdf.html), the FLI8532 includes a version of DCDi Cinema that includes not only per pixel motion adaptive de-interlacing, but also 3:2 pull down detection and processing, e.g.:

FAROUDJA DCDi CINEMA™ FORMAT CONVERSION

- Low Angle De-interlacing Processing
- Per Pixel Motion Adaptive De-interlacing (MADi) up to 1080i format
- Format conversion up to SXGA resolutions
- Panoramic and Anamorphic Non-linear Scaling
- Adaptive Media Display Processing for 3:2 and 2:2 video content
- Adaptive 3D Noise Reductions
- Media Noise Reduction for MPEG inputs

28.   The claim chart of Exhibit C explains the basis for my opinion that various DCDi Cinema enabled Genesis chips families are used by Vizio infringe the '840 patent. However, I will describe a summary of the analysis supporting my conclusion below.

-15-

1   29.   Genesis Cinema includes modules for format detection and

2 conversion. The basic functionality for the Genesis chips (as exemplified by the

3 FLI 8532) is described in the data sheet cited above and in the following diagram:

FLI8532 SYSTEM DIAGRAM
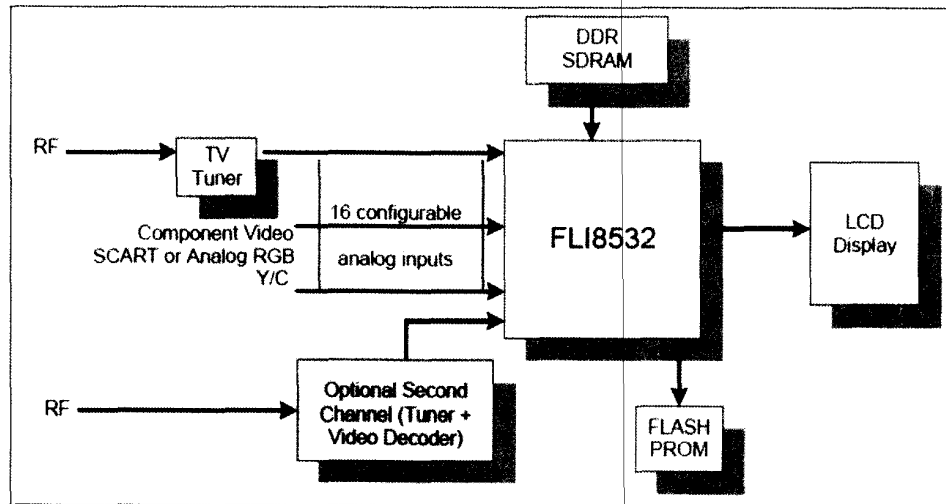
12 In addition, this same datasheet describes the processing of various neighborhoods

13 in connection with format detection, conversion and enhancement as reflected in

14 the 3x3 matrices cited in the FLI 8532 functional block diagram:

FLI8532 FUNCTIONAL BLOCK DIAGRAM
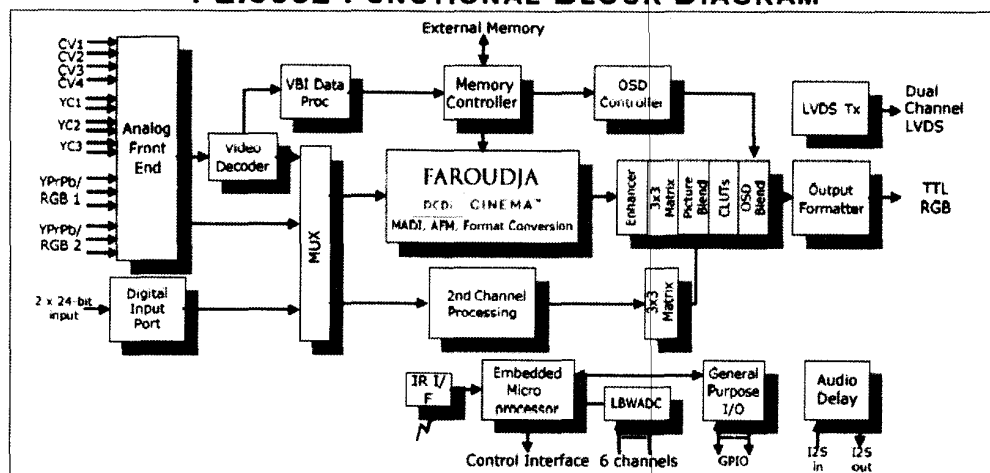
22   30.   Furthermore, I have personally tested the processing functions of

23 Vizio televisions employing the FLI 8532 functionality. Specifically, I tested a

-16-

1   GV46L television to show the removal of entropy or random pixels based upon the

2   detection of signal type (e.g., film mode). The images I tested, as shown below,

3   reflect the DCDi processing of the signal both before and after the automatic

4   detection of the presence of a film type input. As can be seen with the corrected

5   image on top, there are certain fine errors in the details of the test image (e.g., the

6   jaggies on the infield white stripe, and moiré patterns or waves on the seats in the

7   stands). The second photo shows that the processor has locked into the cadence,

8   thus removing these artifacts. This occurs in about a ¼ of a second on the GV46L

9   Vizio TV:

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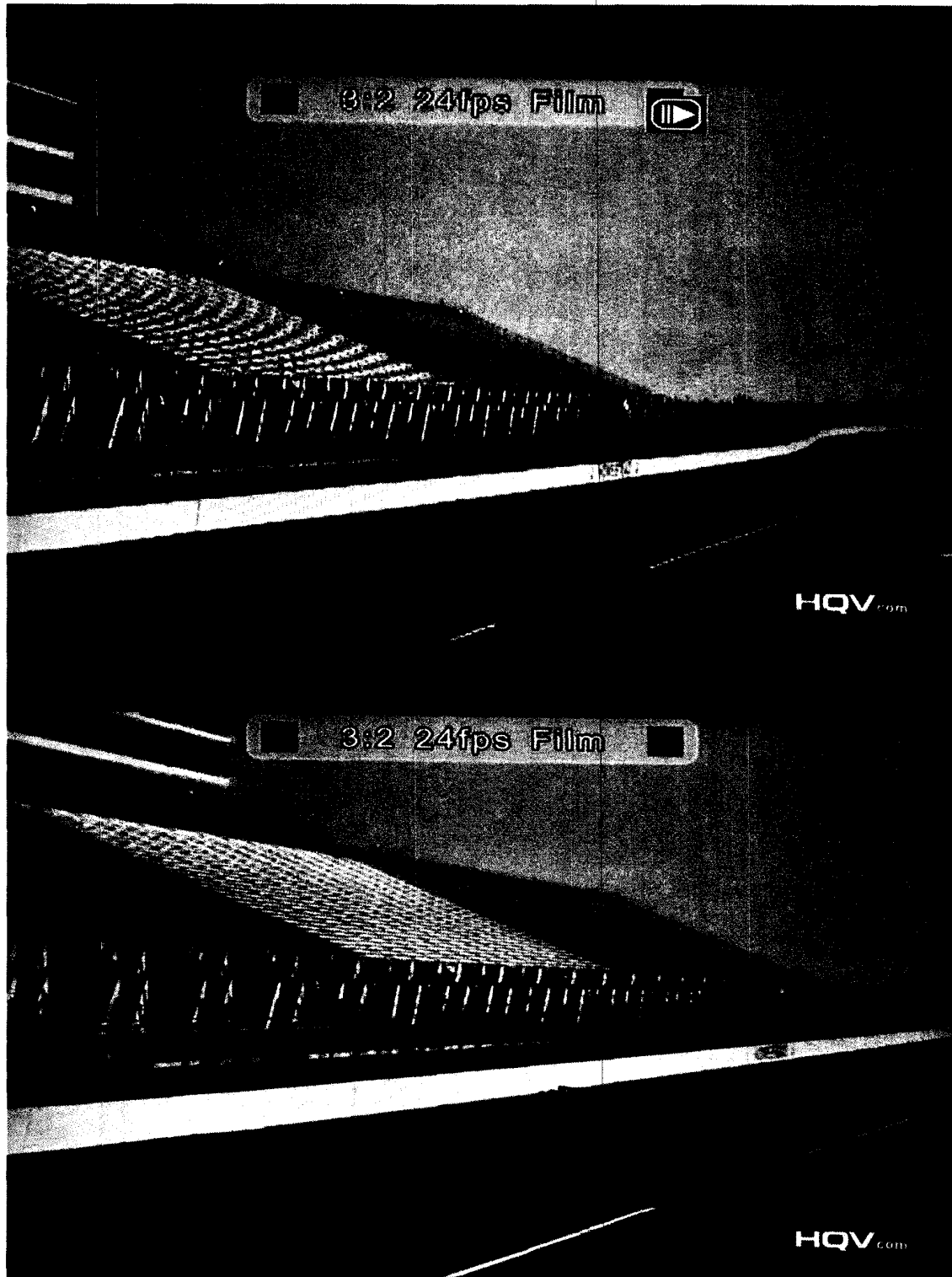
31.   Based upon this analysis (as set forth more fully in Exhibit C), I have determined that Vizio products using DCDi processing with cadence error

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1   detection and processing infringe claims 56-59 and 62 of the '840 patent.

2   **D.   Infringement by Vizio Products Using MDDi Enabled Chips**

3   32.   It is my opinion that many Vizio televisions use MediaTek chips to

4   handle video processing and enhancement as part of their routine functions. Based

5   upon publicly available information that I have reviewed, it is my opinion that such

6   chips use MediaTek's MDDi ("Media Direct De-Interlacing") technology. An

7   example of such chips and technology as used in Vizio's televisions may be found

8   in the Service Manual for Vizio's VX32L and VW32L televisions, which is

9   available   at

10 http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV2

11 0A_AUO_LPL_Samsung_Service_Manual_C.pdf. That manual (at page 7-3)

12 provides a simple diagram for the video processing chip used by Vizio:

System Block Diagram
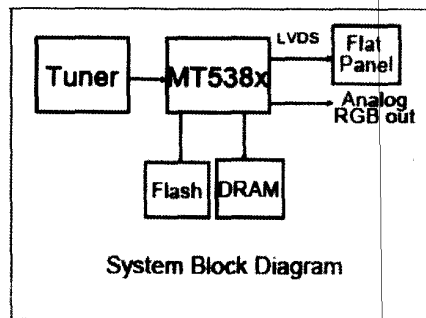
19 The functional block diagram below further clarifies the presence of the de-

20 interlacing function in that chip (as shown in the reference to "de-interlace"):

-19-

Functional Block Diagram
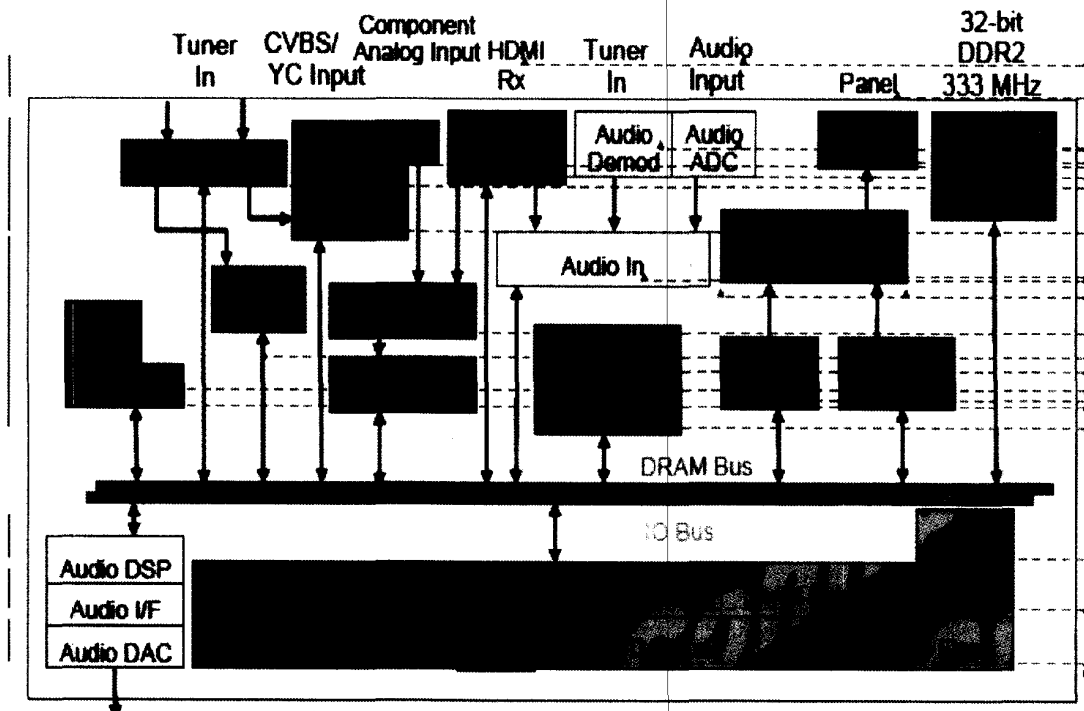
Other publicly available service manuals for Vizio televisions incorporating MDDi further tout the television's ability to detect film source or 3:2 pull down source (in order to compensate for errors from such editing processes), and further tout the excellence of low angle image processing used by the Vizio televisions as part of the de-interlacing process:

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EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES – CASE NO. CV 12-5707-MRP (E)

6. Video Plane:
    1. Support video capture and over scan
    2. Flesh tone management
    3. Gamma/anti-Gamma correction
    4. Color Transient Improvement (CTI)
    5. 2D peaking
    6. Saturation/hue adjustment
    7. Brightness and contrast adjustment
    8. Black and White level extender
    9. Adaptive Luma/Chroma management
    10. Automatic detect films or video sources
    11. 3:2/2:2 pull down source detection
    12. The MT5380 support bob mode de-interlace.
       The MT5381 support 1366 width motion-adaptive de-interlace.
       The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire
       MT538x family supports excellent low angle image processing.

http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV2
0A_AUO_LPL_Samsung_Service_Manual_C.pdf at 7-5.

33. The claim charts of Exhibits D and E explain the basis for my opinion that various MDDi enabled MediaTek chips families that are used by Vizio infringe the '842 and '840 patents. The analysis supporting my conclusion is summarized as follows:

34. Since the end of 2003, MediaTek appears to have touted its MDDi features in a variety of different video processor chips. (See http://www.myce.com/news/MediaTek-introduces-DivX-Pro-chip-with-DRM-for-on-line-movies-7340/, December 12, 2003 press release discussing "MediaTek's patent-pending scan algorithm, the MDDi (media direct de-interlacing) technology"). The MDDi feature appears to have been subsequently patented. (See http://www.prnewswire.com/news-releases/mediatek-releases-worlds-first-120hz-soc-solutions-for-high-end-smart-tv-136719823.html, noting "MediaTek's patented MDDi™ de-interlace solution"). The use of the MDDi solution is reflected in a variety of chip model numbers used in Vizio televisions, including

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1   televisions using the MediaTek MT8202 and MT5351 chips (see, e.g.,

2   http://nationalservicealliance.com/visio/VIZIO-GV42L_HDTV.pdf), the MT5372

3   (See,   e.g.,

4   http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Servic

5   e_Manual_C.pdf), the MT5380, MT5381, the MT5382 (the so called MT538x

6   family, as discussed above).

7   35.   As part of my analysis, I have relied upon a search by counsel on the

8   LEXIS/NEXIS database of U.S. patents involving the terms "MediaTek" and "de-

9   interlacing," the search being limited to issued patents which were filed by 2004 or

10 earlier and which were assigned to MediaTek. In the absence of any discovery

11 from Vizio providing further detail beyond the publicly available service manuals

12 also cited in my report, I have relied upon such information in a limited fashion (as

13 set forth in the claim charts) to describe de-interlacing processes owned and

14 claimed by MediaTek. If or when any information is provided by Vizio which

15 gives further detail into the operation of its MDDi enabled televisions (or an

16 identification of further specific sets containing such features), I reserve my right

17 to supplement or modify my opinions as set forth in this report and its attached

18 charts.

19 **III.   CONCLUSION**

20   36.   In this report and in the claim charts attached as Exhibits, I have

21 analyzed Vizio televisions and displays and/or related documentation that

22 incorporate HQV video processing chips from Silicon Optix (now Qualcomm),

23 DCDi video processing chips from Genesis Microsystems, and MDDi processing

24   -22-

1 chips from MediaTek. Based on my experience and analysis, my opinions are that

2 a) the de-interlacing processes enabled by the HQV and MDDi enabled chips (and

3 therefore into the Vizio products employing such chips) infringe claims 7-9 and

4 14-15 of the '842 patent; and b) the de-interlacing processes enabled by the DCDi

5 and MDDi enabled chips (and therefore into the Vizio products employing such

6 chips) infringe claims 56-59 and 62 of the '840 patent

7   37.   This analysis is based on information that has been provided to me to

8 this date. I reserve my right to supplement my opinion based on additional

9 evidence or documentation produced in this case.

10   I swear under penalty of perjury that the foregoing to true to the best of my

11 knowledge and belief.

12 Date: _____   _D. Michael Holmes_____

                                    D. Michael Holmes

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EXHIBIT A

TO

EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES

D. Michael Holmes
4700 Hunington Drive
Bryan, Texas 77802
(979) 774-2941

SUMMARY

Provides technical consulting and expert testimony in the field of LCD and LED indoor and outdoor electronic display systems. Pioneered several advances in the state of the art of thermal management for outdoor, sunlight-readable LCD display devices. Expert in the area of electronic display product design, LCD panel construction, LCD system integration (including HDTVs and computer monitors), LCD and LED display system end-product manufacturing, color reproduction methods used in LCD and plasma display devices, electronic drive means for generating variable colors in multi-color and full-color LED display systems, sync separator devices and HDTV scaling devices.

Has extensive experience working with patents and other intellectual property matters, including providing attorney consultation on patent claims, depositions, preparation and participation in Markman hearings, preparation for and testifying in Federal Court patent litigation, and development of computer graphic visual aids and physical demonstrative exhibits for trial use.

Has over 30 years experience in corporate management, engineering management, project management, and detailed design of electronic display systems, analytical laboratory and petrochemical instrumentation. Has successfully developed a market-driven product line strategy, has directed all R&D and design activities, and has transitioned new products into full production. Has served as director of manufacturing for an electronic display manufacturer, overseeing all phases of LCD and LED product production.

PROFESSIONAL EXPERIENCE

Holmes Development, Bryan, Texas   **1992-Present**

President/Owner
Founded and managed contract engineering firm specializing in expert consulting, electronic systems design and analysis, precision electromechanical design, and software development. Most recent business has involved the testing, analysis and documentation of major manufacturer's plasma and LCD high definition TV/monitors for potential patent infringement related to certain color reproduction methods. Has also served as an expert witness related to LCD panel design and panel manufacturing details, which includes TCP bonding methods and controller board placement. Projects also include the mechanical design and packaging of RISC processor based instrumentation used by the electric power industry, electronic and mechanical design of 19 inch rack-mount instrumentation, and precision mechanical fixturing and positioning mechanisms for semiconductor automated test equipment used in the manufacture and testing of integrated circuits. Other projects include the design of electronic flowmeters, flow computers and flow logging software. Key customers include General Electric, Texas Instruments, Texas A&M University, Smith Meter Corp., Technology Licensing Corp., Watonga Technology, Inc., Pixel Instruments and various IP law firms.

Texas Digital Systems, Inc., College Station, Texas   **1996 to 2005**

Chief Technology Officer (2004–2005)
Directed and oversaw all corporate technical matters, and developed a technology strategic plan that supported the overall company mission. Had primary responsibility for all patent and intellectual property activities involving the company. Continually evaluated technology trends for possible application within the company to retain competitive advantage. Oversaw research programs to assure the company's competitive position and to meet long-range strategic goals. Kept abreast of competitive landscape as well as market and customer needs. Interfaced directly with major customers at the corporate level (Burger King Corp., McDonalds Corp., Wendys Corp., Tim Hortons Corp., Sonic,

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Mettler Toledo, AAFES, Commerce Bank, etc.). Was directly responsible for custom product development and all customer negotiations for a $4M+ outdoor LCD digital signage contract with Tim Hortons of Canada in Q1 of 2005. Had primary responsibility for the customer contact, development and delivery of an indoor digital merchandising project (hardware, software, media creation, deployment) for Burger King Corp. in Q1-Q2 of 2005.

VP Engineering (1997–2004)
Directed the development of LCD, LED and plasma electronic display systems for corporate visual communications and quick-serve restaurant applications. Was actively involved in various corporate IP related litigation activities. Acted as corporate technical expert for patent infringement litigation (LED displays), participated in multiple depositions, designed and constructed physical demonstratives for trial. Was deposed and testified in Federal Court patent trial. Prepared DVD-based multimedia visual aids designed to reduce complex patent concepts to simple-to-understand concepts.

Recruited and managed a team of electrical, mechanical, and software development engineers to develop a product line consisting of cutting-edge outdoor electronic color display systems. Established and implemented departmental policies for new product development, document control, manufacturing release, and engineering changes. Played a significant role in developing business relationships with several major customers, including Burger King Corporation ($27M contract) and McDonald's Corporation ($10M contract).

Was directly responsible for all manufacturing operations and product quality control (1997- 2000). Oversaw the relocation of manufacturing facilities three times over a three-year period to accommodate increased production requirements. Was responsible for selection and implementation of an Enterprise Management software package, thus automating and integrating MRP, production planning control and product configuration (BOMs) with other departmental functions.

Director of Engineering (1996-1997)
Directed the activities of mechanical and electrical engineering for the development of new indoor and outdoor electronic display systems. Responsible for the design of new products and for the sustaining engineering of existing products. Redesigned several existing LED display systems for reduced cost, higher performance and design for manufacturability (DFM).

O.I. Analytical, College Station, Texas (Formerly Oceanography International Corp.) **1988-1992**

Product Section Head (1990-1992)
Responsible for all R&D and Engineering activities for the design of analytical instrumentation used for environmental analysis. Directed Electrical and Mechanical Engineers, Chemists, Draftsmen, and Technicians for the design of environmental analyzer systems and instruments to conformance with EPA specifications. Responsible for multiple engineering cost centers, with annual budget exceeding $1.2M. Negotiated all contracts for outside engineering services. Implemented "Concurrent Engineering" and "Design for Manufacture" practices within the company. Designed, tested and certified products for compliance with CSA, UL, VDE safety standards and applicable EMI/RFI requirements.

Engineering Manager (1988-1990)
Managed the development of electronic systems for all sample introduction and detector products. Specified and procured departmental CAD systems for schematic capture, circuit analysis, PCB design, and mechanical drafting. Exercised project management responsibility for embedded controller hardware and software design, mechanical packaging, user interface design, and system integration. Hardware consisted of Intel 80188, 8051 and 8085 family processor-based designs for the control of various electromechanical and electropneumatic devices including stepper-motors, pumps, valves, heaters, fans, and displays. Designed analog sub-systems including various signal conditioners, data acquisition MUX, A/D, and precision D/A circuits. Developed multi-tasking, real-time control and PID closed-loop control software in Assembly, PLM86, and C languages.

Oceanography International Corporation, College Station, Texas   **1980-1988**

Vice President, Engineering (1985-1988)

Directed the development of analytical laboratory and oilfield instrumentation products. Established departmental policies for new product development, document control, manufacturing release, and engineering changes. Appraised for effectively using human resource management skills in recruiting, employee personal development, and motivation (management by objectives). Performed as Radiation Safety Officer certified by State of Texas, 1986-1992

Project Engineer (1982-1985)

Coordinated the design of offshore oil and gas platform instrumentation, downhole production logging tools, and Total Organic Carbon Analyzers. Controller designs used Z80, 8080, Z8 and TI9900 microprocessors. Traveled internationally and performed field installations, system commissioning, and training of platform operators and service engineers on four North Sea oil production platforms.

Design Engineer (1980-1982)

Designed Sonic Sand Detector (SSD) components and systems for the petroleum industry. Pioneered multi-phase flow noise suppression scheme for third generation SSD equipment. Designed intrinsically safe sensors for hazardous environments. Designed and constructed multi-phase flow test loops for instrument test and calibration.

Monitec Systems, Inc., Bryan, Texas   **1981-1992**

Vice President

Co-founded electronics manufacturing company. Designed and marketed critical-equipment remote monitoring and alarm systems for the telecommunications industry.

Custom Sounds, Inc., Bryan Texas   **1976-1980**

Vice President – Commercial Products Division (1978-1980)
Service Manager (1976-1978)

Established audio equipment service department for local retail sales operation. Performed equipment repairs, designed and installed custom commercial sound systems, and performed sales duties.

EDUCATION

M.B.A., Texas A&M University, College Station, Texas, 1993.

B.S., Electrical Engineering, Texas A&M University, College Station, Texas, 1977

Completed more than 20 other courses and seminars in Instrument Systems Design, EMI/RFI Control, Gas Chromatography, Management of R&D Organizations, Effective Human Resource Management Technique, Digital Signal Processing, Fiber optics, Electronic Components, Bar Code Technology, Computer-Aided Design, and Radioactive Materials Handling.

PUBLICATIONS AND PROFESSIONAL AFFILIATIONS

Technical papers presented at the Pittsburgh Conference on Applied Chemistry and Spectroscopy:

"Finally! Totally Automated Volatiles Analysis Using Interactive Purge And Trap Control with the Personal Computer", Presented in Chicago, Illinois, 1991.

"Understanding GC Instrument Interface Protocols For Successful Multi-Vendor Component Integration", Presented in New Orleans, Louisiana, 1988.

"Practical Interconnection of Multi-Vendor Components for EMI (Noise) Reduction in Laboratory Instrument Systems", Presented in Atlantic City, New Jersey, 1987.

Member: Instrument society of America, Houston Chapter, 1986-1992

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ALL CASES IN WHICH, DURING THE PREVIOUS 4 YEARS, D. MICHAEL HOLMES HAS TESTIFIED AS AN EXPERT AT TRIAL OR BY DEPOSITION

Case Name	Client:	Counsel:	Case/Project Summary:
In Re: TFT-LCD (Flat Panel) Antitrust Litigation Case No. 3:07-md-1827 SI (N.D. Cal.)	Shughart Thompson & Kilroy P.C. (Plaintiff)	Shughart Thompson & Kilroy P.C.	Served as expert witness/consultant in the area of <u>LCD applications</u> in various consumer and commercial products. Case related to class action lawsuit against various LCD manufacturers allegedly engaged in illegal price fixing.

[4]

EXHIBIT B

TO

EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

Vizio (or its customers or retailers) have infringed claims 7, 8, 9, 14, 15 of U.S. Patent No. 6,239,842 ("the '842 patent") within the meaning of 35 U.S.C. 271(a) by making, using, selling, offering for sale, or importing in to the United States televisions or displays incorporating HQV technology, including at least Vizio's VP505XVT, VP504F, and VP605F. (See **Exhibits 2** and **6**). As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c). See manuals for Vizio TVs, e.g. VP505XVT user manual pages, (**Exhibit 1**); VP504F user manual pages (**Exhibit 7**). This claim chart is meant to be exemplary of infringement by any Vizio television incorporating HQV technology.

The exhibits referenced herein were previously provided to Vizio, as numbered, as part of Oplus' initial service of Infringement Contentions.

Claim	Infringement by Vizio Televisions Incorporating HQV
Claim 7	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with HQV, including Vizio's VP505XVT televisions, make use of HQV technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal.

From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**):

VP505XVT FULL 1080p Plasma with SILICON OPTIX HQV (Hollywood Quality Video) Processing
VIZIO jumps deeper into Full High-Definition 1080p plasma performance with a bang to capture the imagination of even the most discerning consumers with the 50" VIZIO VP505XVT. Plasma TVs are the preferred choice for superior color, higher contrast ratios, longer panel life and fast refresh rates.

To ensure smooth, crisp, clean, and more vibrant images, VIZIO integrated the Silicon Optix's REON HQV processing into the VP505XVT. This advanced technology brings out even the finest details with both Standard Definition (SD) and High Definition (HD) sources. Rendered colors are more natural, showing true color tones as they were intended. Moreover, Silicon Optix HQV's advanced noise reduction removes noise and artifacts caused by signal compression from cable and satellite providers. Since the HQV's REON chip can process two full channels of HD or SD channels, this allows users to achieve full resolution with picture-in-picture images. |

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Infringement Chart
U.S. Patent No. 6,239,842
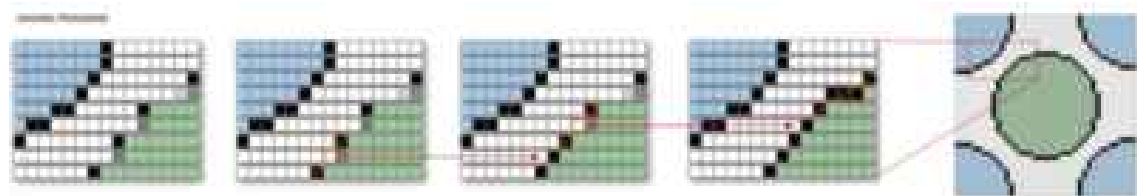**Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F**

	(See also, Exhibit 6). Vizio further points out how this product is being sold through retailers such as Sears, Costco, and Sam's Club: Available through traditional consumer electronics retailers such as Circuit City and Sears and Club retailers like Costco and Sam's Club, the new VIZIO VP505XVT will ship in July with an estimated selling price of $1699.99. http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**) Hollywood Quality Video (HQV) advertises on their website this model makes use of such technology. From HQV's website's products page assessed on 11-27-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=products.displays (**Exhibit 3**) **Vizio** The Vizio VP505XVT products feature the finest technology available today, Including HQV® Hollywood Quality Video™ processing working with full high definition 1080p resolution, these plasma displays offer great visual experience in high-definition flat panel technology. Whether it's High Definition, Standard Definition, or EDTV, the signals are reproduced with amazing results. VP505XTV 50" Plasma TV HQV is a technology suite that performs many video error correction and video enhancement processes, including a pixel-based motion adaptive de-interlacing process. This process is shown on HQV's website's de-interlacing technology page accessed on 1-20-2011 and and August 2, 2012 at http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**):

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	IDT HQV approach (pixel-based motion adaptive) HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. Pixel-based motion-adaptive de-interlacing avoids artifacts in moving objects and preserves full resolution of non-moving portions of the screen even if neighboring pixels are in motion.
(a) receiving the interlaced video format feature a sequence of fields of pixels to be de-interlaced;	The Vizio televisions receive an interlaced format video signal which is made up of a sequence of interlaced fields of pixels. HQV technology includes de-interlacing video, and states that 4 fields are used "to implement a true per-pixel motion-adaptive deinterlacer." The 4 fields being part of the sequence of fields of the interlaced format video signal. http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**):
(b) evaluating logical operations of linear combinations of values selected from the group consisting of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values	This element requires that the missing pixels, that is the spatial pixels which are missing from an interlaced video field, are identified through averaging and/or other mathematical operations, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels. For example, the values of the missing pixels will be determined using the values of existing pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image. Vizio televisions using HQV technology utilize HQV's pixel-based motion adaptive de-interlacing technique to try to correct these sorts of common errors as well. HQV notes that its pixel-based motion adaptive process for de-interlacing discards only pixels that would cause

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor'; and	artifacts by analyzing movement at the pixel level across temporally related fields to measure the movement. In other words, HQV's processes must take a multitude of potential values to be used to fill in for the missing current pixels and perform logical operations upon them to determine the best fit value in light of the motion present. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital HQV ICs utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital HQV ICs to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images. As stated by Jed Deame, a co-founder and General Manager of Teranex/SiliconOptix: HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution.

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

* * *

"Second Stage" Diagonal Interpolation To recover some of the detail lost in the areas in motion, HQV processing implements a multi-direction diagonal filter that reconstructs some of the lost data at the edges of moving objects, filtering out any "jaggies." This operation is called "second-stage" diagonal interpolation because it's performed after the deinterlacing, which is the first stage of processing. Since diagonal interpolation is independent of the de-interlacing process, competitors have used similar algorithms with their frame-based de-interlacing approaches.

http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)**

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

(c) deciding upon assignment of values to missing spatial pixels according to results of said logical operations	As shown above, Vizio televisions using HQV must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image (e.g., where motion is not detected), and through the step of assignment of values based upon, e.g., diagonal interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the deinterlaced image are avoided.
Claim 8	
The method of claim 7 , wherein said sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of aid fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields.	Because the interlaced video signals which the Vizio Televisions with HQV all meet video standards (e.g. NTSC, 1080i HDTV) the sequence of fields of pixels to be deinterlaced features a current spatial field featuring missing spatial pixels (i.e. the missing pixels of the missing scan lines of video) and spatial pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values) and at least one temporal field (e.g. the immediately previous or immediately past field) with temporal pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values. See http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf (**Exhibit 3**) ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").
Claim 9	
The method of claim 7, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said	In order for the HQV technology to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame. See

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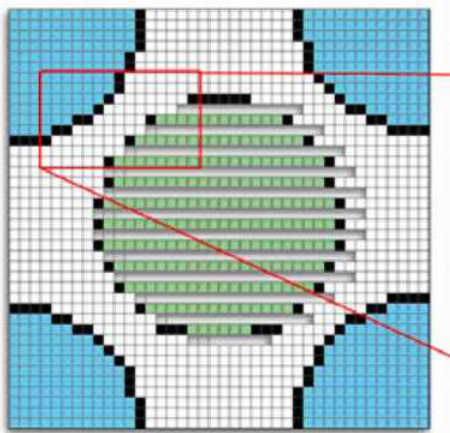
Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

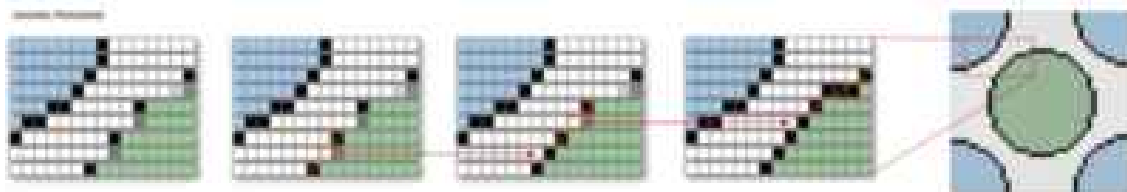|	
sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf (**Exhibit 3**) ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").
Claim 14	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio Televisions with HQV make use of HQV technology to give them an advantage in video quality, and in particular an advantage in deinterlacing when receiving a 1080i HD signal and/or 480i signal and converting to progressive video. From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**): From the Press Release accessed on 11-27-2011 and August 2, 2012 at http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**): **VP505XVT FULL 1080p Plasma with SILICON OPTIX HQV (Hollywood Quality Video) Processing** VIZIO jumps deeper into Full High-Definition 1080p plasma performance with a bang to capture the imagination of even the most discerning consumers with the 50" VIZIO VP505XVT. Plasma TVs are the preferred choice for superior color, higher contrast ratios, longer panel life and fast refresh rates. To ensure smooth, crisp, clean, and more vibrant images, VIZIO integrated the Silicon Optix's REON HQV processing into the VP505XVT. This advanced technology brings out even the finest details with both Standard Definition (SD) and High Definition (HD) sources. Rendered colors are more natural, showing true color tones as they were intended. Moreover, Silicon Optix HQV's advanced noise reduction removes noise and artifacts caused by signal compression from cable and satellite providers. Since the HQV's REON chip can process two full channels of HD or SD channels, this allows users to achieve full resolution with picture-in-picture images. (See also, Exhibit 6).

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	Vizio further points out how this product is being sold through retailers such as Sears, Costco, and Sam's Club:

Available through traditional consumer electronics retailers such as Circuit City and Sears and Club retailers like Costco and Sam's Club, the new VIZIO VP505XVT will ship in July with an estimated selling price of $1699.99.

http://www.noydcom.com/press_release/vizio/XVT/VIZIO_XVT_PR_FNL.pdf (**Exhibit 2**)

Hollywood Quality Video (HQV) advertises on their website this model makes use of such technology. From HQV's website's products page assessed on 11-27-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=products.displays (**Exhibit 3**)

Vizio

The Vizio VP505XVT products feature the finest technology available today, Including HQV® Hollywood Quality Video™ processing working with full high definition 1080p resolution, these plasma displays offer great visual experience in high-definition flat panel technology. Whether it's High Definition, Standard Definition, or EDTV, the signals are reproduced with amazing results.

VP505XTV 50" Plasma TV

HQV is a technology suite that performs many video error correction and video enhancement processes, including a pixel-based motion adaptive de-interlacing process. This process is shown on HQV's website's de-interlacing technology page accessed on 1-20-2011 and August 2, 2012 at http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**):

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	IDT HQV approach (pixel-based motion adaptive) HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. Pixel-based motion-adaptive de-interlacing avoids artifacts in moving objects and preserves full resolution of non-moving portions of the screen even if neighboring pixels are in motion.
receiving the interlaced video format featuring a sequence of fields of pixels to be de-interlaced;	The Vizio televisions receive an interlaced format video signal which is made up of a sequence of interlaced fields of pixels. HQV technology includes de-interlacing video, and states that 4 fields are used "to implement a true per-pixel motion-adaptive deinterlacer." http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**): The 4 fields being part of the sequence of fields of the interlaced format video signal.
using a current spatial field featuring missing spatial pixels and said spatial pixels with known values, located in said sequence of said pixels,…	HQV's deinterlacing process includes "the two fields being analyzed in the current frame[.]" http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**). For purposes of understanding, the current field may be considered the one of the two which is being deinterlaced.
and one temporal field featuring temporal pixels with known values, located in said sequence of said fields,…	"In addition to the two fields being analyzed in the current frame, the two previous fields are required in order to determine which pixels are in motion." http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**). "HQV Processing continues to analyze at the per-pixel level using four-field analysis even in high-definition." http://www.hqv.com/index.cfm?page=tech.de-interlacing (**Exhibit 4**) For purposes of understanding, the temporal field is one being used along with the current field to accomplish deinterlacing of the current field.
…for determining values of said	Vizio televisions incorporating HQV use the data from the temporally related fields (as detailed

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Infringement Chart

U.S. Patent No. 6,239,842

Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

missing pixels of said current spatial field;	further below) to establish the values of the missing pixels. E.g. the current field and the temporal field are utilized to provide values for the missing pixels in the current spatial field.
evaluating logical operations of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of said temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater	This element requires that the missing pixels are identified through averaging and/or other mathematical operations, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels.

For example, the values of the missing pixels will be determined using the values of existing pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image.

Vizio televisions using HQV technology utilize HQV's pixel-based motion adaptive de-interlacing technique to try to correct these sorts of common errors as well. HQV notes that its pixel-based motion adaptive process for de-interlacing discards only pixels that would cause artifacts by analyzing movement at the pixel level across temporally related fields to measure the movement. In other words, HQV's processes must take a multitude of potential values to fill in for the missing current pixels and perform logical operations upon them to determine the best fit value in light of the motion present.

The logical operations used are selected from those Boolean Logic operations greater than, |

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

than, greater than or equal to, less than, less than or equal to, `and`, `or`, and `xor`; and	greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital HQV ICs utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital HQV ICs to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images. As stated by Jed Deame, a co-founder and General Manager of Teranex/SiliconOptix: HQV processing represents the most advanced de-interlacing technique available: a true pixel-based motion-adaptive approach. With HQV processing, motion is identified at the pixel level rather than the frame level. While it is mathematically impossible to avoid discarding pixels in motion during de-interlacing, HQV processing is careful to discard only the pixels that would cause combing artifacts. Everything else is displayed with full resolution. * * *

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Infringement Chart
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Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

	"Second Stage" Diagonal Interpolation To recover some of the detail lost in the areas in motion, HQV processing implements a multi-direction diagonal filter that reconstructs some of the lost data at the edges of moving objects, filtering out any "jaggies." This operation is called "second-stage" diagonal interpolation because it's performed after the deinterlacing, which is the first stage of processing. Since diagonal interpolation is independent of the de-interlacing process, competitors have used similar algorithms with their frame-based de-interlacing approaches. http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)**
deciding upon assignment of said values to said missing spatial pixels according to results of said logical operations.	As shown above, Vizio televisions using HQV must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image (e.g., where motion is not detected), and through the step of assignment of values based upon, e.g., diagonal interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts.
Claim 15	
The method of claim 14, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field	In order for the HQV technology to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame. See

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with HQV, Including VP505XVT, VP504F, and VP605F

to said current spatial field located in said sequence of said fields.	http://www.digitalsalesgroup.com/directlines/onkyo/newsletters/HQV_processing_for_Reon.pdf **(Exhibit 5)** ("HQV processing uses a per-pixel motion-adaptive and noise-adaptive temporal filter to avoid the artificial appearance and artifacts associated with conventional noise filters. To preserve maximum detail, moving pixels do not undergo unnecessary noise processing. In static areas, the strength of noise reduction is determined on a per-pixel basis, depending on the level of noise in the surrounding pixels as well as in previous frames, allowing the filter to adapt to the amount of noise in the image at any given time.").

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A003102

EXHIBIT C

TO

EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Vizio (or its customers or retailers) have infringed claims 56, 57, 58, 59, and 62 of U.S. Patent No. 7,721,840 ("the '840 patent") within the meaning of 35 U.S.C. 271(a) by making, using, selling, offering for sale, or importing into the United States televisions or displays incorporating Faroudja DCDi technology, including at least Vizio's P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P. (See Exhibits 14, 17, 18, 19, 20, 21, 23.) As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c). See manuals for Vizio TVs, e.g. P50HDTV10A user manual (**Exhibit 14**). This chart is meant to be exemplary of infringement by any Vizio television or display incorporating Faroudja DCDi technology. The exhibits referenced herein were previously provided to Vizio, as numbered, as part of Oplus' initial service of Infringement Contentions.

Claim Element	Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P,GV46L, RP56, L13 and JV50P
56. A method determining entropy of a pixel of a real time streaming digital video image signal,	

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Infringement Chart
U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	Vizio's P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P televisions use Faroudja/Genesis chips to give the product advantages in video quality. See, e.g.: **Exhibit 14**, at 2

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

VIZIO VM60P HDTV User Manual

Chapter 7 Miscellaneous Information

7.1 Specifications

Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m^2 (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.
Speakers	Built-in, 20W x 2
Panel Life	45,000 hours to half the original brightness
Power	
Input	IEC Connector for direct power line connection
Voltage Range	100 ~ 240Vac at 50/60Hz

Exhibit 17 at 63

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Infringement Chart
U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

VIZIO GV46L HDTV User Manual

Chapter 7 Miscellaneous Information

7.1 Specifications

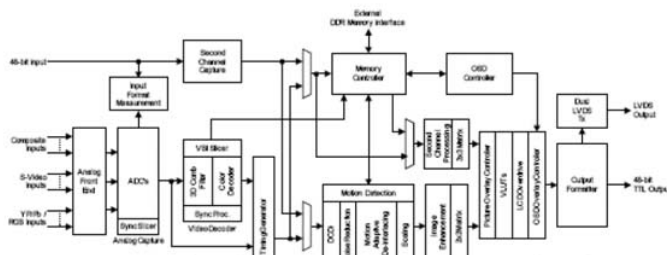| Specificatons	
Panel	46" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.7455mm (H) x 0.7455mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	16.77 Million
Brightness	500 cd/m² (typical)
Contrast	1200:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 2x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	Zero Bright Pixel, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer 640x480, 800x600, 1024x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, 6500K in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.
Speakers	Detachable, 10W x 2 + 20W Sub
Panel Life	50,000 hours to half the original brightness
Power	

Exhibit 18 at 68.

A003107

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	VIZIO RP56 USER GUIDE
	1 Introduction
	Features
	• Huge 56-inch screen.
	• HDTV 16:9 Aspect Ratio.
	• Only 18.9 inches / 480 mm deep.
	• 75.9 lbs/34.5kg light.
	• Bright flicker free picture.
	• 480P, 720P, 1080I and HDTV signal compatibility.
	• 480i support for old NTSC television.
	• 640x480 VGA, 800x600 SVGA, 1024x768 XGA computer signal compatibility.
	• When displaying film-based media the TV automatically converts the content using 2:3 Pull Down to minimize motion artifacts to produce a stunning picture.
	• Uses DCDi™ Motion Adaptive Deinterlacing for state-of-the-art conversion of interlaced (NTSC or 1080i HD) to progressive scan.
	• DVI input with HDCP for the best display of Digital Video from components such as the VINC award winning Bravo Multi-Media Player that is recognized as providing the best picture from DVD and CD.
	Exhibit 19 at 1.

A003108

Infringement Chart

U.S. Patent No. 7,271,840
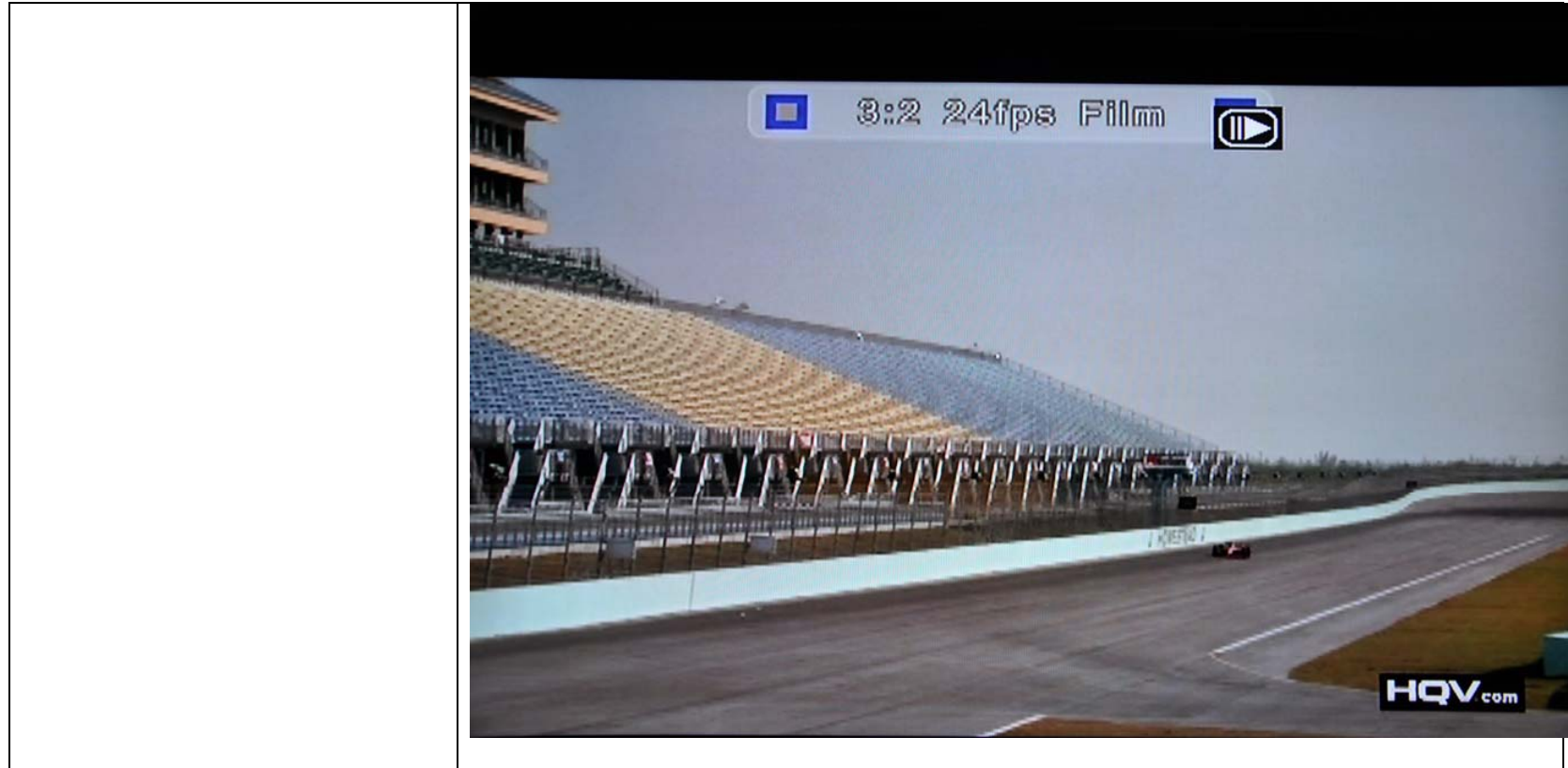
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	VIZIO L13 LCD HDTV Specifications

Display	Screen Size	13.0 in.
	Display Type	LCD
	Resolution	640x480
	Display Capability	480i
	Contrast Ratio	500:1
	Aspect Ratio	4:3
	Brightness	450 cd/m²
	Response Time	15 ms
	Comb Filter	3D
	Viewing Angle	H 170 / V 155°
	Number of Colors	16.77 Million Colors
	Backlight Life	40000 hrs.
Size	Dimensions (WxHxD)	16.8 in. x 14.2 in. x 7.7 in. (42.67 cm x 36.07 cm x 19.56 cm)
	Weight	9.0 lbs. (4.08 kg)
Input	Composite Video	1 x Composite Video
	Composite Audio	1 x Composite Audio
	S-Video	1 x S-Video
	Component Video	1 x Component Video
	Component Audio	1 x Component Audio
	PC / VGA	1 x PC / VGA
	PC / VGA Audio	1 x PC / VGA Audio
	Cable / Antenna	1 x Cable / Antenna
Output	Headphone Jack	1 x Headphone Jack
Audio	Output Mode	Stereo
	Output Power	2.5W
	Number Speakers	2
Convenience Features	Parental Lock	V-Chip
	Closed Caption	Yes
	Additional Features	DCDi De-Interlace Progressive Scan

Exhibit 20.

A003109

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	Here is Vizios newest plasma......i mean surround sound.........i guess both 🙂 http://www.vizio.com/products/detail.aspx?pid=32 Introducing VIZIO's newest All-In-One home theater solution, the VIZIO JV50P "Jive" Plasma HDTV. VIZIO's JV50P "Jive" sets a new benchmark for home entertainment, being the first TV manufacturer in the industry to offer a 50" High-Definition Plasma TV coupled with a true Dolby Digital 5.1 surround-sound system. The new JV50P "Jive" offers true digital High Definition TV performance with integrated digital TV tuner, support for 1080i resolution, amazing 15,000:1 contrast ratio and an optical audio input to allow your new VIZIO "Jive" to be your all-in-one home theater solution. DCDi by Faroudja Low Angle De-interlacing Processing for superior video quality. VIZIO Universal Backlit and ergonomic Remote Control and TV With" Wireless Speakers" option enabled, wireless transmission takes place at 5.8GHz **Exhibit 21**

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	The operation of Video Processor FLI8532 The Genesis Microchip FLI8532 includes an integrated 3-D Digital Video Decoder with Faroudja DCDi CinemaTM video format conversion, video enhancement, and noise reduction. The auto-detection and Faroudja DCDi CinemaTM technology allow the FLI8532 to detect, process, and enhance any video or PC graphic format. The FLI8532 supports many worldwide VBI standards for applications of Teletext, Closed Captioning, V-Chip, and other VBI technologies. http://nationalservicealliance.com/visio/VIZIO-P50HDM.pdf (P50HDM Service Manual) The Faroudja/Genesis processing chips included in these Vizio televisions use (for instance) Genesis' Faroudja DCDi technology which performs a method determining entropy of a pixel of a real time streaming digital video image signal. This is an aspect of a motion adaptive noise reduction process. For example, from a data sheet accessed on 1-19-2011 at http://www.datasheetarchive.com/FLI2300-datasheet.html (**Exhibit 22**):

A003111

Infringement Chart
U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	The FLI2300 Digital Video Format Converter produces the highest quality upconverted video output from a variety of interlaced video inputs including 525i/50 (NTSC), 625i/50 (PAL or SECAM), 480p/60, 720p/60, 1080i/60 (ATSC) and RGB graphics up to SXGA, with a maximum pixel rate of 75 MHz. It uses patented and patent pending motion-adaptive deinterlacing that selects the optimal filtering on a per-pixel basis to produce maximum resolution without introducing motion artifacts. This includes film mode for proper handling of 3:2 and 2:2 pulldown as well as bad edit detection and correction, technologies invented by Faroudja Laboratories. Prior to deinterlacing, the built-in motion-adaptive noise-reducer can be used to improve the signal-to-noise ratio, resulting in further improved deinterlacing. Another proprietary feature is Directional Correlational Deinterlacing (DCDi™). This technology identifies edges at any angle in
	Vizio products operate with a real time streaming digital video image signal, commonly referred to as a video signal. In deinterlacing, noise reduction and resolution enhancement operations it is necessary to determine pixel entropy in order to properly determine which of the neighboring pixels (in time and space) a particular pixel is related to in order to properly perform these and other features to prevent, or at least greatly reduce, errors or noise in the image.
for automatically correcting an error produced during real time editing of the real time streaming digital video image input signal,	The video signal utilized by the Vizio products include movies which are originated on film and converted from film to video utilizing 3:2 pulldown conversion which produces a 3:2 cadence in the video signal. The video signals are often edited without reference to the 3:2 pulldown cadence thus creating errors in the cadence. Therefore, Vizio's televisions perform error correction which must, by nature, be automatic. See the pictures below, taken of the GV46L:

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Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

A003113

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

| comprising the steps of: receiving and characterizing the streaming digital video image input signal during a pre-determined time interval; | Among other features of the Genesis chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. . The Motion Adaptive Noise Reduction must utilize a temporal filtering system because it must read and recognize movement, which is impossible without considering multiple frames or fields across a pre-determined time interval. In particular it is necessary to first characterize the input video signal as a particular progressive or interlaced format signal since e.g. there is no need to deinterlace a progressive signal (although a progressive signal may have been previously deinterlaced and may contain cadence error related errors which resulted from the previous deinterlacing and that progressive signal may also be subsequently |

A003114

Infringement Chart
U.S. Patent No. 7,271,840
**Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and
JV50P**

	converted to an interlaced signal). The following is from Genesis Microchip's technology page accessed on 1-19-2011 at http://www.gnss.com/technology.phtml

Exhibit 24:

- **Motion Adaptive Noise Reduction**
  Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. Genesis uses Motion Adaptive processing to reduce noise without introducing smearing. |
| assigning and characterizing a local neighborhood of neighboring pixels to each input image pixel of the streaming digital video image input signal, in a temporal interlaced sequence of three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal, said three consecutive fields being a previous field, a next field, and a current field; and | This element requires that the video error correction method select an area (the entirety or a subset) of a field, then also establish identical areas in the field before and the field after. This selection creates a sequence of temporal field neighborhoods for analysis for each input image pixel.

The Motion Adaptive Noise Reduction of the Genesis chipset utilized by Vizio's televisions must consider a temporal field to detect motion and cadence with any accuracy, which is further indicated by the fact that the technology is based on temporal noise reduction filtering. Only through considering a temporally related portion of time may motion and cadence be properly detected to ensure that error correction does not affect motion to create the smearing or ghosting that Genesis warns of above.

E.g., **Exhibit 25** p. 17**:** |

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also, Exhibit 26. |
| determining the entropy of each virtual pixel, of each previous pixel, and of each next pixel, in said temporal interlaced sequence of said three consecutive fields, relative to said assigned and characterized local neighborhoods of said neighboring pixels, said determining comprising the steps | This element requires the pixels of the temporal fields to be compared to detect pixels affected by noise, which is a form of video error that is based on the entropy of the data. The noise can for example result from a cadence error which results in moving (e.g. from different film frame) pixels being placed in the wrong temporal sequence. For purposes of explanation, a pixel which is temporally out of place will have a large difference as compared to its temporally neighboring pixels and thus a high entropy or randomness, which pixel may be considered to be noisy. |

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

| of: | For the Genesis chipset utilized by Vizio's televisions to perform temporal comparisons, especially for the motion detection, it must measure the value of each pixel, then measure the value of other pixels in the same spatial neighborhood across multiple temporally associated frames. Comparing these values is how noise can be established to be affecting any pixels within these temporally associated frames. E.g., **Exhibit 25** p. 17:

When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also**, Exhibit 26.** |

A003117

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	See **Exhibit 24:** **Motion adaptive noise reduction** Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.
calculating values of pixel inter-local neighborhood parameters for each said previous pixel in said previous field, and for each said next pixel in said next field, whereby each said value of each said pixel inter-local neighborhood parameter represents a regional sum of inter-local neighborhood weighted distances measured between said neighboring pixels located in subsets of said assigned and	This element is the first step of the above comprising element, where the selected area of (i.e. inter-local neighborhood) the fields are compared, detecting the changes that occur between each and to create a weighted change between each. For purposes of understanding, the changes may be considered to be inter-local noise or randomness which may result e.g. from cadence errors and/or motion. When the Genesis chipset utilized by Vizio's televisions compares these temporally related frames, the values of the neighborhood of pixels on each much be measured, then compared to establish the change over time among the temporally related fields. E.g., **Exhibit 25** p. 17:

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

characterized local neighborhood of each said virtual pixel in said current field, and said assigned and characterized local neighborhood of each said previous pixel in said previous field, and of each said next pixel, in said next field, respectively;	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).
	With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135^0). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90^0.
	The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.
	See also**, Exhibit 26.**
	See **Exhibit 24:**
	## Motion adaptive noise reduction
	Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

A003119

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

calculating a value of a virtual-pixel intra-local neighborhood parameter, for each said virtual pixel in said current field;	A value is calculated for each virtual pixel which value is a measure of its randomness in its intra-local neighborhood. For purposes of understanding, the changes may be considered to be intra-local noise or randomness which may result e.g. from cadence errors and/or motion. Once the Genesis chipset utilized by Vizio's television performs its measurements and comparisons, calculation must be made to determine what the proper value of a pixel affected by noise should be. E.g., **Exhibit 25** p. 17**:**

A003120

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240–line field to a 480–line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135^0). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90^0.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also**, Exhibit 26.**

See **Exhibit 24:**

Motion adaptive noise reduction

Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing. |
| adjusting a value of a pixel entropy | This element requires it to be established which pixels in each of the temporally related |

A003121

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

counter for each said previous pixel in said previous field, for each said next pixel in said next field, and for each said virtual pixel in said current field; and	fields are affected by noise or other errors, to establish the level of entropy for that pixel. After all, noise in a previous or next field should not be considered in the calculation for the proper value of a pixel in the current field. The counters are used to track which of the various pixels have large amounts of entropy as compared to their corresponding pixels in the adjacent fields. For the Genesis chipset utilized by the Vizio televisions calculations to be accurate for what the error corrected value should be, pixels also affected by noise should not be used. In addition, the chipset further relies on the measurement of movement in pixels between the frames to avoid creating ghosting by use of moving elements in the frames. E.g., **Exhibit 25** p. 17**:**

A003122

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

When a deinterlacer scales a 240–line field to a 480–line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).

With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135^0). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90^0.

The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.

See also**, Exhibit 26.**

See **Exhibit 24:**

Motion adaptive noise reduction

Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

calculating a value of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field from said values of said pixel entropy counters of said pixels, whereby said values of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field, in the streaming digital video input image signal are used for automatically deciding, by performing sequences of mathematical logical operations, not to use values selected from the group consisting of value of a said previous pixel in said previous field, and value of a next pixel in said next field, for assigning a real value to said virtual pixel in said current field in said global input grid of pixels featured in the streaming digital video input image signal, thereby correcting an error produced during real time editing of the streaming digital video image input signal.	This element takes the conclusions from the above steps to establish the new, proper, value for any pixels in the current field affect by noise.

The Genesis chipset utilized by Vizio's televisions then uses the correct, applicable , pixels in the neighboring fields to determine the new value for the pixels in the current field that must be adjusted and then actually adjust to said value. Applying the result of the calculations to replace the pixels affected by error is also performed.

Also of note, the Genesis chipset utilized by Vizio's televisions does not utilize only the Motion Adaptive Noise Reduction for temporal filtering. The TrueLife Enhancement and Cross Color Suppression also are based on temporal filtering, because they, like the above, require the measurement of movement between frames.
By way of explanation, this step ensures that when a value selected for the virtual pixel of an image in the current field is selected, the pixels of a different image in the previous or next field are not utilized in that selected value.

See, E.g., **Exhibit 25** p. 17**:** |

A003124

Infringement Chart
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Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

	When a deinterlacer scales a 240-line field to a 480-line frame, another word for that process is upsampling, because it uses 240 lines worth of input samples (or pixels) to create 480 lines of output samples. Hence the number of samples is going up. Simplicity itself. To do this, each pixel of the 480 line output is created by applying a weighted average of several of the input pixels. Under normal circumstances, those input pixels will be the ones just above and below the output pixel's location. In other words, the sampling angle is completely vertical (or 90 degrees).
	With DCDi™, the direction of sampling can vary from pixel to pixel. When creating an output pixel, the algorithm looks at a small local patch of input pixels, and looks for a strong diagonal contour. If there is one, then the sampling direction is set to be perpendicular to the local contour. For example, if the algorithm determines that there is a 45-degree diagonal line running through the pixel in question, then the input samples will be gathered along a diagonal line that crosses the line in the image at a right angle (or 135°). When there is no easily identifiable contour, the algorithm falls back on the standard angle of 90°.
	The result of all this math is a much smoother image, with fewer annoying jagged edges. It doesn't necessarily look exactly like the "true" image that you'd see if the source were higher resolution, because the algorithm can't magically recreate details that aren't there in the source, but it does represent a better interpolation of the image, more like what a human might do if asked to smooth out the image by hand. It's also possible to see artifacts at times where the algorithm looks worse than the simpler strategy (for example the resolution wedge on the WHQL disc), but those are few and far between. Most of the time, DCDi™ is a big improvement.
	See also**, Exhibit 26.**
	See **Exhibit 24:**
	## Motion adaptive noise reduction
	Noise on an image is typically eliminated or reduced by filtering. Filtering can be done spatially, (2-D), or temporally, (3-D). Spatial filtering results in a soft image with loss of detail. Temporal filtering does not create loss of detail, but if done incorrectly, does result in smearing or ghosting of moving objects in the image. ST uses Motion Adaptive processing to reduce noise without introducing smearing.

A003125

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Claim 57	
57. The method of claim 56, whereby in step (a) the streaming digital video image input signal is received following subjecting the streaming digital video image input signal to a pull down mode conversion method selected from the group consisting of a 3:2 pull down mode conversion method, a 2:2 pull down mode conversion method, and a scan rate conversion, other than the 3:2 pull down mode conversion and the 2:2 pull down mode conversion, from a non-interlaced film format or a progressive video format to an interlaced video format.	The processing chips included in these Vizio televisions use (for instance) Genesis' Faroudja DCDi technology's Format Converter IC operates with 3:2 and 2:2 pulldown. For example, from a data sheet accessed on 1-19-2011 at http://www.datasheetarchive.com/FLI2300-datasheet.html (**Exhibit 22):** The FLI2300 Digital Video Format Converter produces the highest quality upconverted video output from a variety of interlaced video inputs including 525i/50 (NTSC), 625i/50 (PAL or SECAM), 480p/60, 720p/60, 1080i/60 (ATSC) and RGB graphics up to SXGA, with a maximum pixel rate of 75 MHz. It uses patented and patent pending motion-adaptive deinterlacing that selects the optimal filtering on a per-pixel basis to produce maximum resolution without introducing motion artifacts. This includes film mode for proper handling of 3:2 and 2:2 pulldown as well as bad edit detection and correction, technologies invented by Faroudja Laboratories. Prior to deinterlacing, the built-in motion-adaptive noise-reducer can be used to improve the signal-to-noise ratio, resulting in further improved deinterlacing. Another proprietary feature is Directional Correlational Deinterlacing (DCDi™). This technology identifies edges at any angle in moving images and interpolates along the edge to produce smooth, natural images without the staircasing or jaggies produced by other deinterlacing technologies. The FLI2300 also includes motion-adaptive...
Claim 58	
58. The method of claim 56, whereby step (b) further comprises: (i) assigning a first local neighborhood of said neighboring pixels to each said virtual pixel within a missing horizontal line of said current field.	The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit17** at 63:

A003126

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

Chapter 7 Miscellaneous Information
7.1 Specifications

Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m² (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset.

See also, **Exhibit 14; Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**.

When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises DCDi assigning a first local neighborhood of said neighboring pixels to each virtual pixel within a missing horizontal line (i.e. the even or odd lines) of the current field (which contains the odd or even lines respectively). This association arises because of the standard interlacing format of NTSC video and results in proper deinterlacing of the input video signal in the presence of static images in the video signal. |
| Claim 59 | |
| 59. The method of claim 58, whereby step (b) further comprises: (ii) assigning a second local neighborhood of said neighboring | The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit 17** at 63: |

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

pixels to each said pixel located in said previous field, and to each said pixel located in said next field.	**Chapter 7 Miscellaneous Information** **7.1 Specifications** | Specifications	
Panel	60" Diagonal, 16:9 Aspect Ratio
Resolution	1366 x 768 pixels
Pixel (Dot) Pitch	0.966mm (H) x 0.966mm (V)
Display Compatibility	HDTV (720P)
Signal Compatibility	480i (SDTV), 480P (EDTV), 720P (HDTV), 1080i (HDTV)
Colors	1.07 Billion (10 bit)
Brightness	1200 cd/m² (typical)
Contrast	7000:1 (typical)
Viewing Angle	>178° (horizontal and vertical)
Inputs	1x Co-axial RF (ATSC/QAM/NTSC), 4x HDMI™ with HDCP (1 with Stereo Audio RCA), 2x Component YPbPr plus Stereo Audio, 1x RGB PC plus Stereo Audio, 2x S-Video plus Stereo Audio (shared in AV1 & AV2), 2x Composite Video plus Stereo Audio (AV1 & AV2)
Outputs	1x 5.1 Audio from DTV input only (SPDIF Optical), 1x Stereo Audio (RCA), 1x Headphone (Stereo Mini Jack)
Features	FHD 1080P support, 4x HDMI inputs, PIP, POP, CC, V-Chip, 3D Comb Filter, Zoom, Freeze, DCDi De-Interlace on Main and PIP screens, 3:2 or 2:2 Reverse Pull-down, ATSC, with 8VSB & QAM demodulation, with MPEG-2 decoding, NTSC Video decoding via RF (Antenna, Cable or Satellite) or Video (CVBS, S-Video or Component), Progressive Scan Video via Component YPbPr, VGA or HDMI, HDTV via HDMI or Component YPbPr, Computer up to 1366x768 via VGA or 640x480 via HDMI, SRS TruSurround XT, Color Temperature of 6500K, 5400K and 9300K (default) in VGA, Warm (5400K), Standard (6500K) and Cool (9300K) in Video, Independent Red, Green and Blue adjustment in TV, Video, HDMI and VGA for user fine tuning of color temperature with reset. | See also, **Exhibit 14**; **Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**. When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises DCDi assigning a second local neighborhood of said neighboring pixels to each pixel located in the previous field and each pixel located in the next field. This association arises because of the standard interlacing format of NTSC video. This operation results in proper deinterlacing of the input video signal in the presence of image motion in the video signal.
Claim 62 62. The method of claim 59, whereby step (b) further comprises: (iii) selecting a said previous pixel and a said next pixel as two sequential pixels in said previous field and in said next field,	The Vizio TVs utilize NTSC video signals. See, e.g. **Exhibit 17** at 63:

A003128

Infringement Chart
U.S. Patent No. 7,271,840
Vizio Televisions or Displays with Faroudja DCDi, Including P50HDTV10A, P50HDM, VM60P, GV46L, RP56, L13 and JV50P

respectively.	
	See also, **Exhibit 14**; **Exhibit 18** at 68; **Exhibit 19** at 1; **Exhibit 20**; **Exhibit 23**.
	When the streaming digital video image input signal is an interlaced NTSC video signal the previous pixel and the next pixel (of the spatial location corresponding to the virtual pixel) in the previous and next fields respectively are selected by DCDi as two sequential pixels. This association arises because of the standard interlacing format of NTSC video and produces proper deinterlacing in the presence of editing errors and field to field image motion.

EXHIBIT D
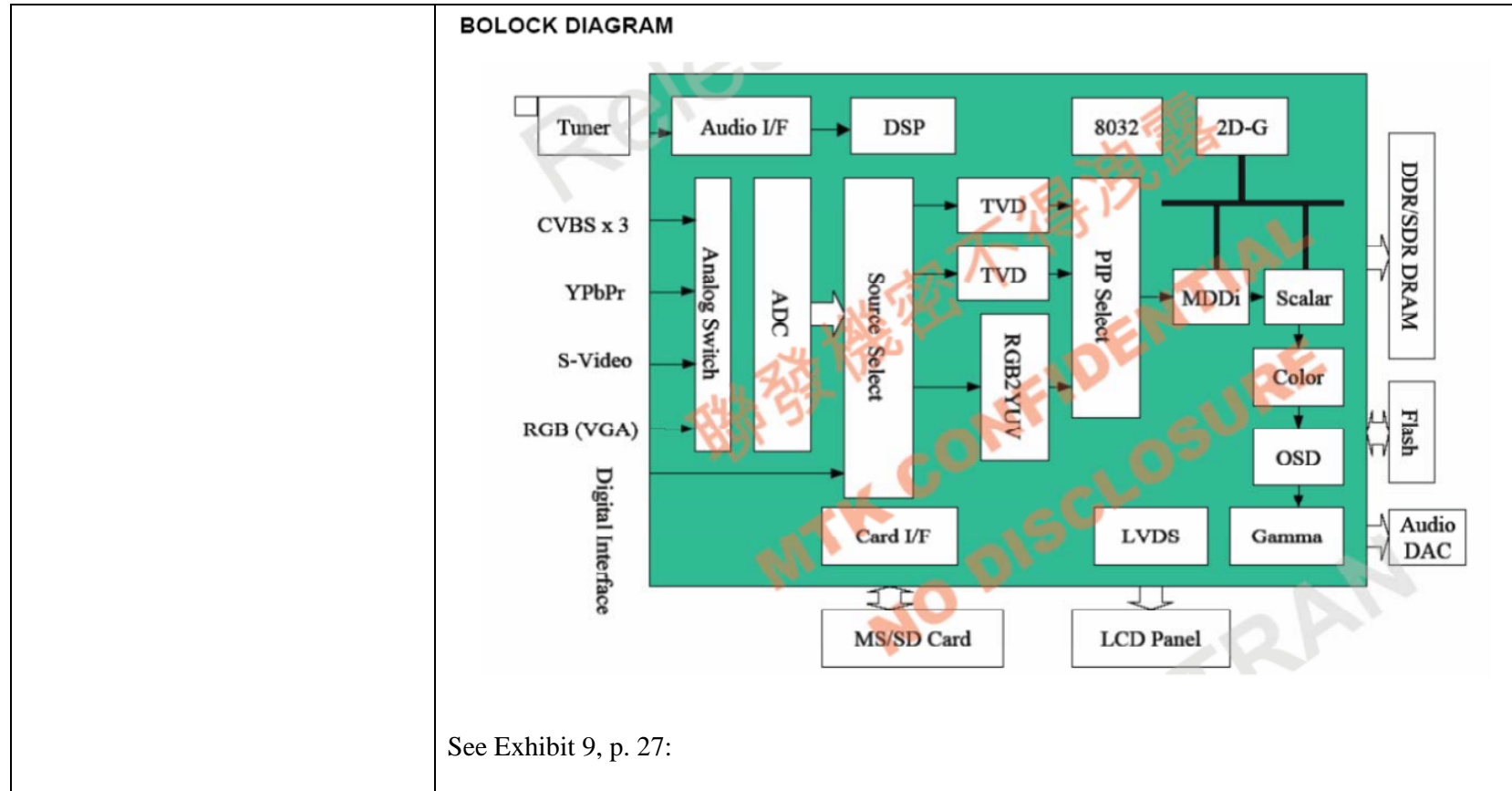
TO

EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Vizio (or its customers or retailers) have infringed claims 7, 8, 9, 14, and 15 of U.S. Patent No. 6,239,842 ("the '842 patent") within the meaning of 35 U.S.C. 271(a) by making, using, selling, offering for sale, or importing in to the United States televisions or displays incorporating MediaTek MDDi Motion Adaptive Deinterlacing technology, including at least Vizio's L42HDTV10A, GV42L, VW46L FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820X video signal processing chips with MDDi). As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c). On information and belief, many more Vizio televisions incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing technology.

Refer to service manuals for the representative Vizio TVs, e.g. VW46L FHDTV10A service manual PDF pages 25-29, **(Exhibit 9)**; L42HDTV10A/GV42L service manual PDF pages 20-26, 50, **(Exhibit 8)**; L37HDTV service manual PDF pages 30-32, 37-43 **(Exhibit 10),** P42HDTV10A service manual PDF pages 25-28, 33-34, **(Exhibit 11)**. The service manual for Vizio's VX32L and VW32L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf
The service manual for the VX37L televisions is available at:
http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

The exhibits referenced herein were previously provided to Vizio, as numbered, as part of Oplus' initial service of Infringement Contentions.

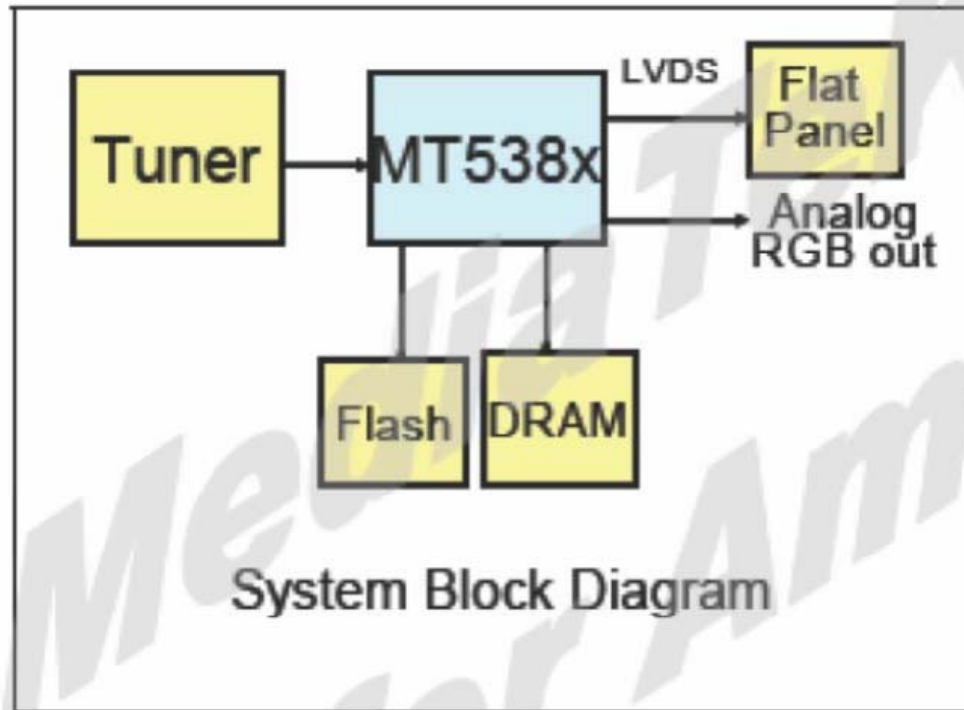| Claim	Infringement by Vizio Televisions Incorporating MDDi
Claim 7	
A method for de-interlacing an interlaced video format, the method comprising the steps of:	Vizio televisions with MDDi use that technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high definition signal.
	All Vizio flat panel (e.g. HDTV) televisions must deinterlace received interlaced video signal (e.g. NTSC, 1080i HDTV) in order to display those signals in progressive form on the flat panel.
	See **Exhibit 8**, p. 26:

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Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

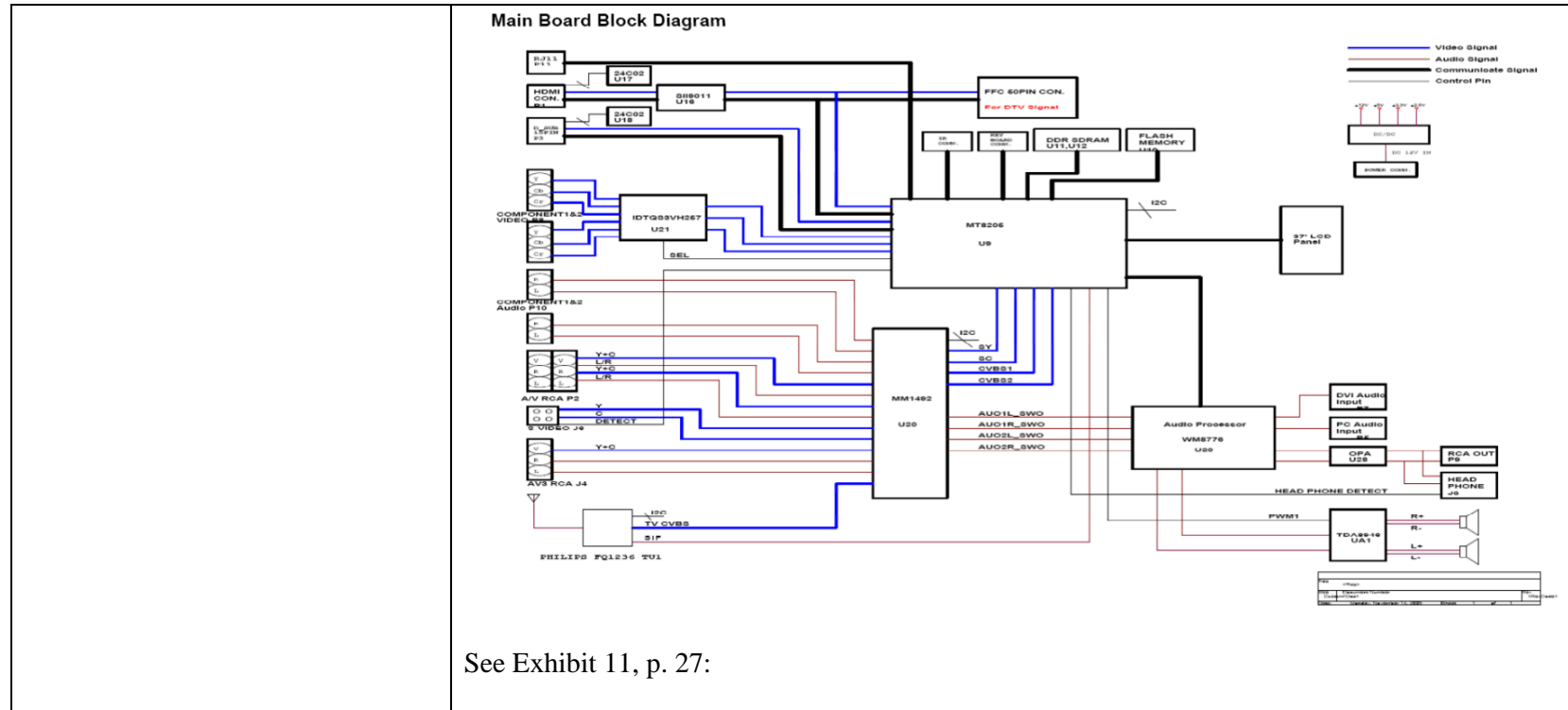|	3.De-interlacing
	
	2nd generation advanced Motion adaptive de-interlacing
	
	Automatic detect film or video source
	
	3:2/2:2 pull down source detection
	
	Main/PIP 2 independent de-interlacing processor
	
	See **Exhibit 8**, p. 50:
	
	whole new viewing experience.Credible Audio/Video Quality : The MT5351 use advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback , The embedded
	
	See **Exhibit 9**, p. 26:
	
	World-Leading Audio/Video Technology: The MT538x family has built-in high resolution and high-quality audio codec. It includes MediaTek MDDi™ de-interlace solution to generate very smooth picture quality for motions. A 3D comb filter added to the TV decoder recovers great detail for still pictures. The special color processing technology provides natural, deep colors and true studio quality graphics.
	
	See **Exhibit 9**, p. 29:
	
	10. Automatic detect films or video sources
	11. 3:2/2:2 pull down source detection
	12. The MT5380 support bob mode de-interlace.
	    The MT5381 support 1366 width motion-adaptive de-interlace.
	    The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire
	     MT538x family supports excellent low angle image processing.

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A003132

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	See **Exhibit 10**, p. 38: **MT8205 Application** MT8205 is a highly integrated single chip for LCD TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. See **Exhibit 10**, p. 43: **b. De-interlacing** Automatic detect film or video source 3:2/2:2 pull down source detection Advanced Motion adaptive de-interlacing See **Exhibit 11**, p. 34:

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A003133

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	MT8205 Application MT8205 is a highly integrated single chip for PDP TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. Optional 2nd HDTV or SDTV inputs allows user to see multi-programs on same screen. Flexible scalar provides wide adoption to various PDP panel for different video sources. Its on-chip audio processor decodes analog signals from Tuner with lip sync control, delivering high quality post-processed sound effect to customers. On-chip microprocessor reduces the system BOM and shortens the schedule of UI design by high level C program. MT8205 is a cost-effective and high performance HDTV-ready solution to TV manufactures.
(a) receiving the interlaced video format feature a sequence of fields of pixels to be de-interlaced;	The interlaced video signal is received by the TV via an antenna connector and tuner and/or video connector. Interlaced video signals by definition incorporate a sequence of fields of pixels with the commonly used interlaced video signals (e.g. NTSC 480i, 1080i) having two fields with one field containing all of the even scan lines and the other field containing all of the odd scanning lines. The fields by definition have missing scanning lines and thus missing pixels of those scanning lines. See **Exhibit 8**, p. 21:

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A003134

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

BOLOCK DIAGRAM

See Exhibit 9, p. 27:

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A003135

Infringement Chart

U.S. Patent No. 6,239,842

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	  See Exhibit 10, p. 31:

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A003136

Infringement Chart

U.S. Patent No. 6,239,842

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

Main Board Block Diagram

See Exhibit 11, p. 27:

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A003137

Infringement Chart
U.S. Patent No. 6,239,842
Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	Main Board Block Diagram
(b) evaluating logical operations of linear combinations of values selected from the group consisting of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels,	This element requires that the missing pixels, that is the spatial pixels which are missing from an interlaced video field, are identified through averaging, creating a multitude of various potential values to calculate off of using any applicable logical operation. This allows a great level of flexibility on calculating ideal formulas and values to utilize to de-interlace the video correcting for common errors that will result from a blind application of the temporal field's pixel values to the current field's missing pixels. For example, the values of the missing pixels will be determined using the values of existing spatial pixels which are taken from the image which the missing pixels are part of, rather than using existing pixels taken from a different image which would cause artifacts in the deinterlaced image.

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minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants, said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor'; and	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants.

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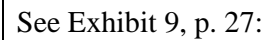|	
	See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (**Exhibit 15**): FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'. Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
(c) deciding upon assignment of values to missing spatial pixels according to results of said logical operations	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the

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	missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the deinterlaced image are avoided. Based on the logical operations, the MDDi circuit makes the assignment of the values to the missing spatial pixels according to the results thus completing the deinterlacing operation.
Claim 8	
The method of claim 7 , wherein said sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of aid fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields.	Because the interlaced video signals which the Vizio televisions with MDDi deinterlacing all meet video standards (e.g. NTSC, 1080i HDTV) the sequence of fields of pixels to be de-interlaced features a current spatial field featuring missing spatial pixels (i.e. the missing pixels of the missing scan lines of video) and spatial pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values) and at least one temporal field (e.g. the immediately previous or immediately past field) with temporal pixels with known values (i.e. the included pixels of the included scan lines of video which pixels have known values).
Claim 9	
The method of claim 7, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the MDDi circuit to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field.
Claim 14	
A method for de-interlacing an interlaced video format, the method	Vizio televisions with MDDi use that technology to give them an advantage in video quality and in particular an advantage in deinterlacing and displaying interlaced video signals as a high

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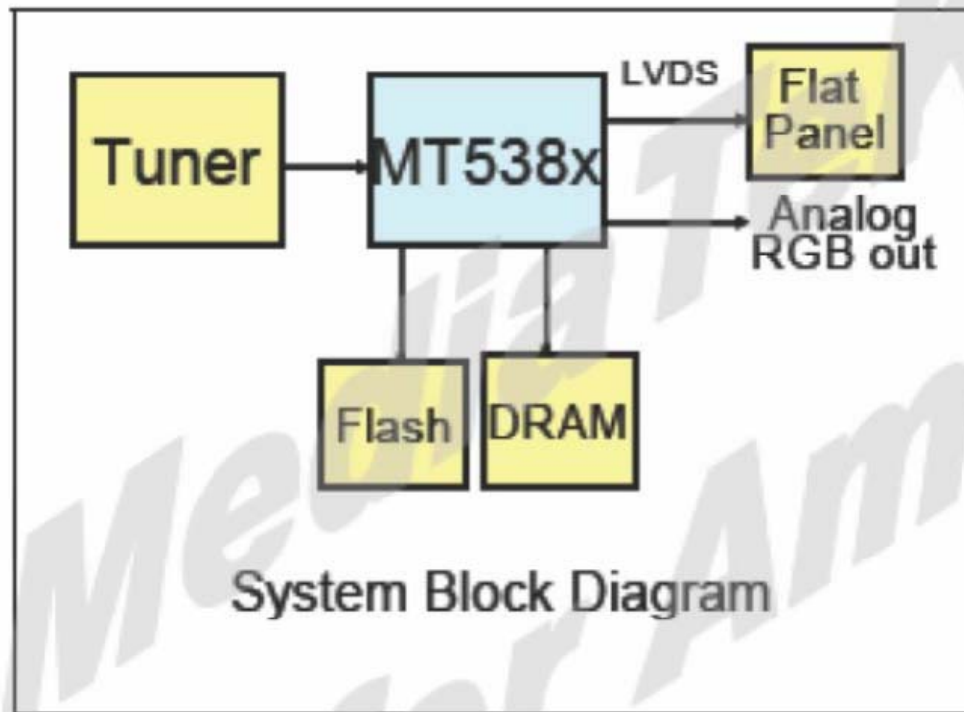
A003141

Infringement Chart
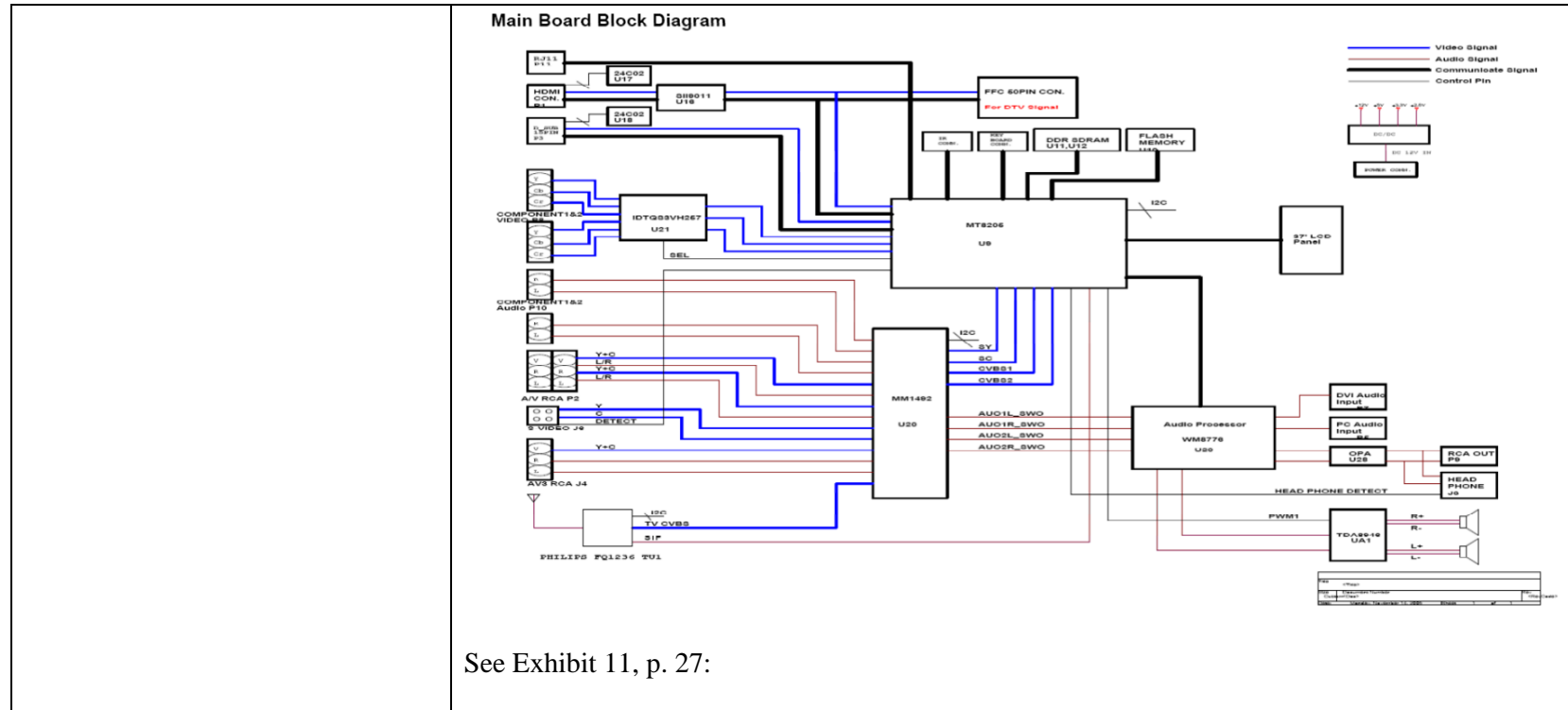
U.S. Patent No. 6,239,842

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

comprising the steps of:	definition signal.
	
	All Vizio flat panel (e.g. HDTV) televisions when receiving a 1080i HD signal or a 480i signal and feeding a progressive video television must deinterlace received interlaced video signal (e.g. NTSC, 1080i HDTV) in order to display those signals in progressive form on the flat panel.
	
	See **Exhibit 8**, p. 26:
	
	3.De-interlacing
	
	    2nd generation advanced Motion adaptive de-interlacing
	
	    Automatic detect film or video source
	
	    3:2/2:2 pull down source detection
	
	    Main/PIP 2 independent de-interlacing processor
	
	See **Exhibit 8**, p. 50:
	
	whole new viewing experience.Credible Audio/Video Quality : The MT5351 use advanced motion-adaptive de-interlace algorithm to achieve the best movie/video playback , The embedded
	
	See **Exhibit 9**, p. 26:
	
	World-Leading Audio/Video Technology: The MT538x family has built-in high resolution and high-quality audio codec. It includes MediaTek MDDi™ de-interlace solution to generate very smooth picture quality for motions. A 3D comb filter added to the TV decoder recovers great detail for still pictures. The special color processing technology provides natural, deep colors and true studio quality graphics.

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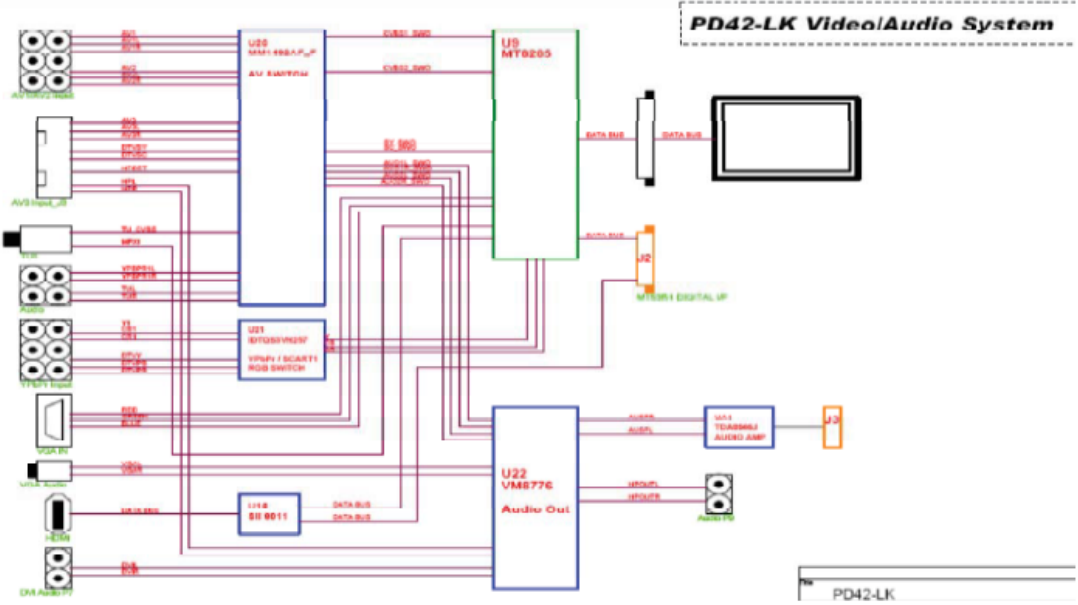**Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology**

	See **Exhibit 9**, p. 29:
	
	10. Automatic detect films or video sources
	11. 3:2/2:2 pull down source detection
	12. The MT5380 support bob mode de-interlace.
	    The MT5381 support 1366 width motion-adaptive de-interlace.
	    The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire
	     MT538x family supports excellent low angle image processing.
	
	See **Exhibit 10**, p. 38:
	
	MT8205 Application
	MT8205 is a highly integrated single chip for LCD TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor.
	
	See **Exhibit 10**, p. 43:
	
	b. De-interlacing
	Automatic detect film or video source
	3:2/2:2 pull down source detection
	Advanced Motion adaptive de-interlacing

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	See **Exhibit 11**, p. 34: **MT8205 Application** MT8205 is a highly integrated single chip for PDP TV supporting video input and output format up to HDTV. It includes 3D comb filter TV Decoder to retrieve the best image from popular composite signals. On-chip advanced motion adaptive de-interlacer converts accordingly the interlace video into progressive one with overlay of a 2D Graphic processor. Optional 2nd HDTV or SDTV inputs allows user to see multi-programs on same screen. Flexible scalar provides wide adoption to various PDP panel for different video sources. Its on-chip audio processor decodes analog signals from Tuner with lip sync control, delivering high quality post-processed sound effect to customers. On-chip microprocessor reduces the system BOM and shortens the schedule of UI design by high level C program. MT8205 is a cost-effective and high performance HDTV-ready solution to TV manufactures.
receiving the interlaced video format featuring a sequence of fields of pixels to be de-interlaced;	The interlaced video signal is received by the TV via an antenna connector and tuner and/or video connector. Interlaced video signals by definition incorporate a sequence of fields of pixels with the commonly used interlaced video signals (e.g. NTSC, 1080i) having two fields with one field containing all of the even scan lines and the other field containing all of the odd scanning lines. The fields by definition have missing scanning lines and thus missing pixels of those scanning lines. See **Exhibit 8**, p. 21:

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	BOLOCK DIAGRAM See Exhibit 9, p. 27:

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

See Exhibit 10, p. 31:

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Main Board Block Diagram

See Exhibit 11, p. 27:

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	Main Board Block Diagram
using a current spatial field featuring missing spatial pixels and said spatial pixels with known values, located in said sequence of said pixels,…	For interlaced video signals (e.g. NTSC, 1080i) by definition the current spatial field has missing scan lines and thus missing pixels of those scan lines with the purpose of deinterlacing being to recreate (at least) those scan lines. The missing spatial pixels are (because they are missing) of unknown value in that field and the included spatial pixels of the included scan lines have known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. For purposes of understanding, the current field may be considered the field for which deinterlacing is being performed using the appropriate interpolation algorithm..
and one temporal field featuring temporal pixels with known values, located in said sequence of said fields,…	Temporal fields include the immediately previous and immediately next fields as set for the in the standards of the received video signal (e.g. NTSC, 1080i) and like the current spatial field above have pixels with known values. The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation.
…for determining values of said missing pixels of said current spatial field;	The current spatial field and temporal field are used to determine the values of the missing pixels of the current spatial field, i.e. MDDi operates to perform deinterlacing of the current spatial field thus creating a progressive field (or frame). The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**):

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation.
	That is, the fixed number of fields (e.g., one temporal field) are used for determining the appropriate motion algorithm which thus determines the value of the missing pixel. For purposes of understanding, the temporal field is one being used along with the current field to accomplish deinterlacing of the current field.
evaluating logical operations of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of said temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants,	The MDDi algorithm is a motion adaptive de-interlacer. (e.g. **Exhibit 8**, p. 26; **Exhibit 9**, p. 29; **Exhibit 10**, p. 38 and 43; **Exhibit 11**, p. 34). See also, e.g., MediaTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**): However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values. Thus, logical operations are evaluated of linear combinations of values selected from the group consisting of averages of said known values of said spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants. See, e.g., MediaTek U.S. Patent No. 6,456,329, Col. 4:45-64 (**Exhibit 15**):

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said logical operations selected from the group consisting of greater than, greater than or equal to, less than, less than or equal to, `and`, `or`, and `xor`; and	FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the transformation operates on the lines of field B, for example, as in FIG. 4, an interpolation by averaging is performed by adding the values of adjacent lines a and b of field B and dividing the sum by two, the result being the averaged line a' of transformed or filtered field B'. Similarly, lines b and c of field B are likewise averaged to produce the averaged line b' of transformed field B'. Preferably, the values of pixels at corresponding horizontal positions along each of the lines are transformed to produce a pixel value for the pixel at that particular position in the transformed line. Also preferably, the transformation Therefore, the best combination of these most likely correct linear combinations to be used to generate the values of the missing pixels are evaluated by logical operations. The logical operations used are selected from those Boolean Logic operations greater than, greater than or equal to, less than, less than or equal to, 'and', 'or', and 'xor' which operations are performed on the selected enumerated linear combinations of values. The Boolean Logic operations including at least 'and' and 'or' are those which are always utilized in digital logic operations in the digital ICs with MDDi utilized by Vizio and the enumerated linear combinations of values are those which are utilized by those digital ICs with MDDi to determine spatial and temporal similarities which are always utilized to determine spatial detail and motion in interlaced video images.
deciding upon assignment of said values to said missing spatial pixels according to results of said logical operations.	As shown above, Vizio televisions using MDDi must decide upon assignment of values as dictated by the logical operations shown and discussed above, both through the initial step of selectively employing temporal placement of pixels from prior fields of the image, and through the step of assignment of values based upon, e.g., interpolation or other digital logic calculations to fill in detail to replace values that might otherwise create feathering or combing artifacts. By way of explanation, the deinterlacing circuit selects pixels which correspond to the same image as the image of the missing spatial pixel to be utilized in the assignment of the value of the missing spatial pixel. By not using pixels from different images, artifacts in the

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	deinterlaced image are avoided. Based on the logical operations, the MDDi circuit makes the assignment of the values to the missing spatial pixels according to the results thus completing the deinterlacing operation.
Claim 15	
The method of claim 14, wherein said one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields.	In order for the MDDi circuit to perform 3:2 pulldown deinterlacing it is necessary to utilize both the immediate previous and immediate next temporal field in order that the 3 field exposure of one film frame may be distinguished from 2 field and 1 field exposures thereby ensuring that at least one of the group of immediate previous and immediate next temporal field is utilized as said one temporal field. This operation ensures that the selected temporal field carries the same image as the current spatial field, i.e. they originate from the same film frame.

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EXHIBIT E

TO

EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES

Infringement Chart

U.S. Patent No. 7,271,840

Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

Vizio (or its customers or retailers) have infringed claims 56, 57, 58, 59, and 62 of U.S. Patent No. 7,271,840 ("the '840 patent") within the meaning of 35 U.S.C. 271(a) by making, using, selling, offering for sale, or importing in to the United States televisions incorporating MediaTek MDDIi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection, including at least Vizio's L42HDTV10A, GV42L, VW46L, FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L televisions (e.g. MediaTek MT535X, MT538X and MT820Xvideo signal processing chips with MDDi). As described, Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c). On information and belief, many more Vizio televisions incorporate MediaTek MDDi Motion Adaptive Deinterlacing technology. This claim chart is meant to be exemplary of infringement by any Vizio television incorporating MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection. As discovery has just begun, Oplus reserves the right to add additional claims and/or products.

Refer to service manuals for the representative Vizio TVs, e.g. VW46L FDDTV10A service manual PDF pages 25-29, (**Exhibit 9**); L42HDTV10A/GV42L service manual PDF pages 20-26, 50, (**Exhibit 8**); L37HDTV service manual PDF pages 30-32, 37-43, (**Exhibit 10**); P42HDTV10A service manual PDF pages 25-28, 33-34, (**Exhibit 11**). The service manual for Vizio's VX32L and VW32L televisions is available at:

http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf

The service manual for the VX37L televisions is available at:

http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX37LHDTV10A_Service_Manual_C.pdf

The exhibits referenced herein were previously provided to Vizio, as numbered, as part of Oplus' initial service of Infringement Contentions.

Claim Element	Infringement by Vizio Televisions or Displays Incorporating MDDi Motion Adaptive Deinterlacing Technology
56. A method determining entropy of a pixel of a real time streaming digital video image signal,	Vizio TVs which utilize MediaTek MDDi Motion Adaptive Deinterlacing with 3:2 Pulldown Detection (hereinafter "MDDi") operate so as to determine the entropy of a pixel of a real time streaming digital video image signal (e.g. a recorded or broadcast digital television signal). Specifically, MDDi utilizes 3:2 deinterlacing. In 3:2 deinterlacing, in order to determine if a

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	given pixel belongs to one field or another, i.e. to determine which field or frame it is related to, it is necessary to determine its entropy. This must be done in real time in order for the Vizio TV to display real time video programs. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57 Vizio products operate with a real time streaming digital video image signal, commonly referred to as a video signal. In deinterlacing, noise reduction and resolution enhancement operations it is necessary to determine pixel entropy in order to properly determine which of the neighboring pixels (in time and space) a particular pixel is related to in order to properly perform these and other features to prevent, or at least greatly reduce, errors or noise in the image.
for automatically correcting an error produced during real time editing of the real time streaming digital video image input signal,	The video signal utilized by the Vizio products include movies which are originated on film and converted from film to video utilizing 3:2 pulldown conversion which produces a 3:2 cadence in the video signal. The video signals are often edited without reference to the 3:2 pulldown cadence thus creating errors in the cadence. Therefore, Vizio's televisions perform error correction which must, by nature, be automatic. See Ex. 8, pp. 21, 26, 50, 52; Ex. 9 , pp. 26, 29, Ex. 10, pp. 38, 43, 59, 61; Ex. 11, pp. 34, 39, 55, 57
comprising the steps of: receiving and characterizing the streaming digital video image input signal during a pre-determined time interval;	The streaming digital video image input signal (i.e. the digital TV input signal) is received by the Vizio televisions during a predetermined time interval. Specifically, the 3:2 deinterlacing performed by MDDi uses a predetermined time interval comprising 3 consecutive fields. Among other features of the Genesis chipset Vizio utilizes, there is the Motion Adaptive Noise Reduction which works off of a temporal filtering system. . The Motion Adaptive Noise Reduction must utilize a temporal filtering system because it must read and recognize movement, which is impossible without considering multiple frames or fields across a pre-determined time interval. In particular it is necessary to first characterize the input video signal as a particular progressive or interlaced format signal since e.g. there is no need to deinterlace a progressive signal (although a progressive signal may have been previously deinterlaced and may contain cadence error related errors which resulted

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	from the previous deinterlacing and that progressive signal may also be subsequently converted to an interlaced signal). However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. MediatTek U.S. Patent No. 7,286,186 at Col. 1:48-56 (Ex. 16) See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57
assigning and characterizing a local neighborhood of neighboring pixels to each input image pixel of the streaming digital video image input signal, in a temporal interlaced sequence of three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal, said three consecutive fields being a previous field, a next field, and a current field; and	The streaming digital video image input signal received by the Vizio televisions contains pixels. MDDi 3:2 deinterlacing requires 3 fields commonly referred to in the art as the current, previous, and next fields. MDDi operates to assign and characterize a local neighborhood of neighboring pixels for each input image pixel of an image in a temporal interlace sequence of the three consecutive fields in a global input grid of pixels included in the streaming digital video input image signal.

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

	However, using the motion-adaptive de-interlacing method is the most efficient way to process interlaced to progressive conversion. The motion-adaptive de-interlacing method generally includes two steps. The first step involves processing motion detection, which means detecting a motion situation by checking a fix number of video fields of the interlaced video signal. Then, the second step involves selecting a proper interpolation algorithm according to the detected motion situation. E.g., Mediatek U.S. Patent No. 7,286,186 at Col. 1:48-56 (**Exhibit 16**) See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57.
determining the entropy of each virtual pixel, of each previous pixel, and of each next pixel, in said temporal interlaced sequence of said three consecutive fields, relative to said assigned and characterized local neighborhoods of said neighboring pixels, said determining comprising the steps of:	This element requires the pixels of the temporal fields to be compared to detect pixels affected by noise, which is a form of video error that is based on the entropy of the data. The noise can for example result from a cadence error which results in moving (e.g. from different film frame) pixels being placed in the wrong temporal sequence. For purposes of explanation, a pixel which is temporally out of place will have a large difference as compared to its temporally neighboring pixels and thus a high entropy or randomness, which pixel may be considered to be noisy. In order to perform 3:2 deinterlacing, MDDI must determine the entropy of each virtual pixel and the previous and next pixel from the previous and next fields in order to know or estimate which of those pixels are obtained from or belong to the same input image frame. See **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9**, pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55, 57. This necessarily requires the following steps, as set forth below.

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Vizio Televisions or Displays with MediaTek MDDi Motion Adaptive Deinterlacing Technology

calculating values of pixel inter-local neighborhood parameters for each said previous pixel in said previous field, and for each said next pixel in said next field, whereby each said value of each said pixel inter-local neighborhood parameter represents a regional sum of inter-local neighborhood weighted distances measured between said neighboring pixels located in subsets of said assigned and characterized local neighborhood of each said virtual pixel in said current field, and said assigned and characterized local neighborhood of each said previous pixel in said previous field, and of each said next pixel, in said next field, respectively;	This element is the first step of the above comprising element, where the selected area of (i.e. inter-local neighborhood) the fields are compared, detecting the changes that occur between each and to create a weighted change between each. For purposes of understanding, the changes may be considered to be inter-local noise or randomness which may result e.g. from cadence errors and/or motion. Thus, the values of parameters for the previous and next field neighborhoods are calculated for each pixel in the previous and next field. The parameters represent the distance weighted sum relative to the virtual pixel for each previous and next field neighborhood. In order to perform 3:2 deinterlacing MDDi must determine the neighborhood parameters of each previous and next pixel neighborhoods from the previous and next fields in order to know or estimate which of the pixels are obtained from or belong to the same input image frame in the presence of field to field motion which results from temporally adjacent fields being derived from different image frames.
calculating a value of a virtual-pixel intra-local neighborhood	A value is calculated for each virtual pixel which value is a measure of its randomness in

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parameter, for each said virtual pixel in said current field;	its intra-local neighborhood. For purposes of understanding, the changes may be considered to be intra-local noise or randomness which may result e.g. from cadence errors and/or motion. The parameter value of the virtual pixel local neighborhood (i.e. the neighborhood in the same or current field as the virtual pixel) is calculated for each virtual pixel. In order to perform 3:2 deinterlacing MDDi must determine the neighborhood parameters of the virtual pixel neighborhood in order to know or estimate which of the previous or next pixels are obtained from or belong to the same film image frame as the virtual pixel.
adjusting a value of a pixel entropy counter for each said previous pixel in said previous field, for each said next pixel in said next field, and for each said virtual pixel in said current field; and	This element requires it to be established which pixels in each of the temporally related fields are affected by noise or other errors, to establish the level of entropy for that pixel. After all, noise in a previous or next field should not be considered in the calculation for the proper value of a pixel in the current field. The counters are used to track which of the various pixels have large amounts of entropy as compared to their corresponding pixels in the adjacent fields. The pixel entropy counter value for each previous and next field pixel is adjusted, as well as for each current field virtual pixel. In order for MDDi to determine or estimate which adjacent field pixel is most closely related to the virtual pixel an entropy counter is utilized to avoid false triggering due to noise, which false triggering would create undesirable image artifacts in the presence of random noise. The value of pixel entropy of the counter is adjusted for each of the previous, next and virtual pixel.

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calculating a value of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field from said values of said pixel entropy counters of said pixels, whereby said values of the entropy of each said previous pixel in said previous field, of each said next pixel in said next field, and of each said virtual pixel in said current field, in the streaming digital video input image signal are used for automatically deciding, by performing sequences of mathematical logical operations, not to use values selected from the group consisting of value of a said previous pixel in said previous field, and value of a next pixel in said next field, for assigning a real value to said virtual pixel in said current field in said global input grid of pixels featured in the streaming digital video input image signal, thereby correcting an error produced during real time editing of the streaming digital video image input signal.	This element takes the conclusions from the above steps to establish the new, proper, value for any pixels in the current field affected by noise. An entropy value is calculated for each previous and next field pixel and for each current field virtual pixel. The values are used to automatically decide, using mathematical logical operations (e.g. digital logic) not to use value of the previous pixel or next pixel to assign a real value to the virtual pixel. By not using one of the previous pixel or next pixel value an error produced during editing of the interlaced video signal is corrected. The values of the pixel entropy counters are utilized by MDDi to calculate a value of entropy for each pixel in the previous, next and present field in order that those values are reasonably accurate and immune to random noise but nevertheless represent the entropy of the respective pixel thereby reducing or preventing improper values of the previous and next pixels from being assigned to the value. By way of explanation, this step ensures that when a value selected for the virtual pixel of an image in the current field is selected that is out of the acceptable range, the pixels of a different image in the previous or next field are not utilized in that selected value.
Claim 57	
57. The method of claim 56,	Vizio Televisions with MDDi utilize a 3:2 and 2:2 pull down mode conversion method.

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whereby in step (a) the streaming digital video image input signal is received following subjecting the streaming digital video image input signal to a pull down mode conversion method selected from the group consisting of a 3:2 pull down mode conversion method, a 2:2 pull down mode conversion method, and a scan rate conversion, other than the 3:2 pull down mode conversion and the 2:2 pull down mode conversion, from a non-interlaced film format or a progressive video format to an interlaced video format.	G . Video Processing :
	
	  1. Advanced Motion adaptive de-interlace on SDTV resolution.
	
	  2. Support clip
	
	  3. 3:2/2:2 pull down source detection.
	
	  4. Arbitrary ratio vertical/horizontal scaling of video , from 1/15X to 16X.
	
	  5. Support Edge preserve.
	
	  6. Support horizontal edge enhancement.
	
	  7. Support Quad-Picture.
	
	Exhibit 11, p. 57.
	
	See also **Exhibit 8**, pp. 21, 26, 50, 52; **Exhibit 9** , pp. 26, 29, **Exhibit 10**, pp. 38, 43, 59, 61; **Exhibit 11**, pp. 34, 39, 55.

Claim 58	

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58. The method of claim 56, whereby step (b) further comprises: (i) assigning a first local neighborhood of said neighboring pixels to each said virtual pixel within a missing horizontal line of said current field.	Vizio TVs utilize NTSC video signals. **Chapter 1 Features** • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit** 9, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal step (b) further comprises MDDi assigning a first local neighborhood of said neighboring pixels to each virtual pixel within a missing horizontal line (i.e. the even or odd lines) of the current field (which contains the odd or even lines respectively). This association arises because of the standard interlacing format of NTSC video.
Claim 59	
59. The method of claim 58, whereby step (b) further comprises: (ii) assigning a second local neighborhood of said neighboring pixels to each said pixel located in said previous field, and to each said pixel located in said next field.	Vizio TVs utilize NTSC video signals. **Chapter 1 Features** • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit 9**, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal step

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	(b) further comprises MDDi assigning a second local neighborhood of said neighboring pixels to each pixel located in the previous field and each pixel located in the next field. This association arises because of the standard interlacing format of NTSC video.
Claim 62 62. The method of claim 59, whereby step (b) further comprises: (iii) selecting a said previous pixel and a said next pixel as two sequential pixels in said previous field and in said next field, respectively.	## Chapter 1 Features • 1024 x 768 pixel resolution with 16:9 wide screen • ATSC (Off-air)/QAM (Cable)/NTSC (Antenna/Cable) See, e.g, **Exhibit 11**, p. 4. See also **Exhibit 10**, p. 6; **Exhibit 9**, p. 20; **Exhibit 8**, p. 18. When the streaming digital video image input signal is an interlaced NTSC video signal the previous pixel and the next pixel (of the spatial location corresponding to the virtual pixel) in the previous and next fields respectively are selected by MDDi as two sequential pixels. This association arises because of the standard interlacing format of NTSC video.

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16 *VIZIO, Inc.*

17   UNITED STATES DISTRICT COURT
18   CENTRAL DISTRICT OF CALIFORNIA
                     WESTERN DIVISION
19

20 OPLUS TECHNOLOGIES, LTD.,   CASE NO.: CV12- 5707 MRP (Ex)

21   Plaintiff,   Hon. Judge Mariana R. Pfaelzer

22   **EXPERT REPORT OF DR. SHEILA**
   v.   **S. HEMAMI REGARDING THE**
23   **INVALIDITY OF U.S. PATENT**
                                     NOS. 6,239,842 AND 7,271,840
24 SEARS HOLDINGS CORPORATION;
   VIZIO, INC.,
25
26   Defendants.

27

28

Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

1 values are to be determined. Campbell computes a variety of "measurement signals"

2 which are based on differences between pixel values along linear directions in the

3 spatial field. For example, one such measurement signal is called V311 which is the

4 variance along line 311 in FIG. 1. The variance is equal to the absolute value of the

5 difference between the values of pixel 103 and pixel 207. Campbell at 3:51-4:1.

6 Another such measurement signal is V312 which is the variance along line 312 in

7 FIG. 1. Here, Campbell looks at spatial pixels that are both on and immediately

8 adjacent line 312 and calculates the sum of the absolute values of the differences

9 between values of pixels having the same positions relative to line 312. The variance

10 for line 312 is the sum of the absolute values of differences between pixels 107 and

11 201, pixels 108 and 202, and pixels 109 and 203. Campbell at 4:2-9.

12   150. Campbell also discloses other "measurement signals" for identifying the

13 best direction for interpolation. In one technique, averages of spatial pixel values are

14 used to calculate normalized pixel values used in computing the measurement signals.

15 Campbell at 4:26-32.

16   151. Campbell "analyzes the measurement signals . . . to select two directions

17 of low variance about the location for [missing] pixel 305, to select the single best

18 direction for interpolation from these two directions . . . ." Campbell at 4:39-44.

19   152. Campbell describes several techniques for identifying the best

20 interpolation direction. One of the techniques involves identifying the linear direction

21 that produces the smallest variance in pixel values. Campbell at 6:6-14 and 45-60.

22 The identification of the minimum variance necessarily involves the use of the logical

23 operator "less than" because each variance must be compared to each other variance

24 to determine which variance is less than all other variances. The minimum variance

25 determines the linear direction for interpolating the known spatial pixel values to

26 arrive at values for the missing pixels. Campbell at 12:15-25. Based on the Court's

27 construction, the calculation of a minimum variance based on the spatial pixel

28 differences would constitute an evaluation of logical operations ("less than") of linear

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1 combinations of known values of spatial pixels. As mentioned previously, it should

2 be noted that Oplus contends that the absolute value of a linear combination is itself a

3 linear combination. Ferraro Decl. at ¶ 31.

4   153. In view of the foregoing, it is my opinion that Campbell anticipates at

5 least claims 7-9 of the '842 Patent.

6   154. Campbell does not discuss the use of temporal fields to arrive at a value

7 for a missing pixel. However, as explained in Section XII.E above, Cooper discloses

8 the use of a spatial scan replicator that makes use of spatial and temporal pixels to

9 arrive at values for missing pixels, including those in interlaced signals. Cooper

10 expressly teaches that "Replication in the time dimension is useful for improving

11 motions artifacts. Time replication is accomplished by using delays of one picture

12 period (field or frame in a monitor device) or more to provide elements in the time

13 axis, which may be used to fill temporal voids. It is particularly useful in a video

14 imaging device." Cooper at 11:38-43. Cooper also expressly teaches the use of *both*

15 spatial and temporal pixels to fill in missing pixels ("These groups may be adjoining,

16 neighboring, having a theoretical similarity, and may be present with a time or space

17 variable or combination thereof"). Cooper at 14:53-56. "Using delays of one picture

18 period . . .or more" would have yielded temporal fields that immediately preceded and

19 followed a current spatial field. And Cooper explicitly shows an application in time

20 in Figure 9. For at least these reasons, in my opinion, it would have been obvious to

21 combine Cooper with Campbell to obtain the method of claims 14 and 15 of the '842

22 Patent.

23   **H.**   **Secondary Considerations of Non-Obviousness**

24   155. As discussed in Section IV.C above, I understand that a showing of

25 obviousness may be rebutted with evidence concerning certain "secondary

26 considerations of non-obviousness." However, I have reviewed the discovery

27 provided by Oplus in this case and am unaware of any evidence of such secondary

28 considerations with respect to the '842 Patent. I reserve the right to amend my report

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1 should Oplus provide evidence of secondary considerations.

XIII. INVALIDITY ANALYSIS OF THE '842 PATENT – INSUFFICIENT WRITTEN DESCRIPTION AND NON-ENABLEMENT

156. **It is my opinion that each of the asserted claims of the '842 Patent is invalid for insufficient written description and lack of enablement.**

157. As construed by the Court, and as argued by Oplus, the "linear combinations" referred to in claims 7 and 14 are those that are *formed from* any or all of the "values" listed in the claims, i.e., any or all of averages of known values of spatial pixels, averages of said known values of temporal pixels, standard deviations of said known values of said spatial pixels, standard deviations of said known values of said temporal pixels, minimums of said standard deviations of said known values of said spatial pixels, absolute values of differences between said averages of said known values of said temporal pixels and said known values of said spatial pixels, said known values of said spatial pixels, and a plurality of constants. Since a linear combination includes weighted combinations of other linear combinations, the variety of "linear combinations" that can be formed from the listed values is virtually boundless.

158. The '842 Patent discloses a ***single set*** of specific linear combinations and logical operations for performing deinterlacing, as shown in FIG. 5/2 (Step 10) and at column 10, lines 60-11-lines 26. In this algorithm, *all of* the following quantities are calculated: 1) the standard deviation ***between*** an average of temporal pixels and an average of spatial pixels (Sigma), 2) the absolute value of the difference between an average of temporal pixels and known values of spatial pixels (steps (iii)-(viii) in Step 10 of FIG. 5/2), 3) averages of known values of temporal pixels (m_T), 3) a previous result of an missing pixel value and an average of temporal pixel values [(Previous-Result) – n_T]. Based on *each and every one of these* calculations, the algorithm arrives at a value of the missing spatial pixel.

159. The '842 Patent does not include any examples or embodiments in which

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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD., Plaintiff, v. SEARS HOLDINGS CORPORATION; VIZIO, INC., Defendants.	CASE NO.: CV12- 5707 MRP (Ex) Hon. Judge Mariana R. Pfaelzer **REBUTTAL EXPERT REPORT OF DR. SHEILA S. HEMAMI REGARDING VIZIO'S NON-INFRINGEMENT OF U.S. PATENT NOS. 6,239,842 AND 7,271,840**

REBUTTAL EXPERT REPORT OF DR. SHEILA S. HEMAMI REARDING VIZIO'S NON-INFRINGEMENT OF
U.S. PATENTS NOS. 6,239,842 AND 7,271,840

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1 assumption.

2   84.   Neither the '186 nor the '329 Patents support Mr. Holmes' conclusion

3 that the VIZIO televisions that allegedly use "MediaTek MDDi Motion Adaptive

4 Deinterlacing Technology" perform the "evaluating logical operations of linear

5 combinations of values" step of the asserted '842 Patent claims. The only portion of

6 the '186 Patent cited by Mr. Holmes reads as follows:

7   However, using the motion-adaptive de-interlacing method is the most
          efficient way to process interlaced to progressive conversion. The
8   motion-adaptive de-interlacing method generally includes two steps. The
          first step involves processing motion detection, which means detecting a
9   motion situation by checking a fix number of video fields of the
          interlaced video signal. Then, the second step involves selecting a proper
10   interpolation algorithm according to the detected motion situation.

11

12 Holmes, Exh. D at 9, citing the '186 Patent at 1:48-56. Nowhere does Mr. Holmes

13 point to any logical operations performed on any of the linear combinations of values

14 covered by the asserted '842 Patent claims.

15   85.   The '186 Patent describes a system for selectively adjusting the number

16 of different temporally separated pixel differences that will be used to determine

17 whether motion is present. The patent contemplates that the motion determination

18 will ultimately be used to select an interpolation algorithm, but no such algorithm is

19 described. The text of the '186 Patent indicates that it does not describe the logical

20 operations of linear combinations of values recited in the '842 Patent claims. Instead,

21 it discloses a circuit that is capable of looking at *different temporal pixel differences*

22 between adjacent temporal fields to determine which algorithm to deinterlace with. It

23 does not evaluate logical operations of linear combinations of any of the values in the

24 Markush groups of claims 7 or 14. The technique is described as follows:

25   Each one of the pixel difference circuits 810a-f computes the pixel value
          difference between a point on two different video fields and generates a
26   detection value as a result. Referencing the example shown in FIG. 3, in
          this embodiment the inputs of the pixel difference circuits 810a-f are
27   pixel values of points **A, B, C, D, E, F, G, H, I shown in FIG. 3**. Each

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REBUTTAL EXPERT REPORT OF DR. SHEILA S. HEMAMI REGARDING VIZIO'S NON-INFRINGEMENT OF
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of the pixel difference circuits 810a-f contains a subtracter 820a-f and an absolute value circuit 830a-f, which can be used to compute the absolute value of the difference between two pixel values. **After a detection value of a pixel difference circuit passes through a corresponding multiplexer, a corresponding comparator will compare the detection value with a predetermined threshold**, then generates a boolean value as a result. Please note that the predetermined thresholds used by the comparators 860a-f could have a common value or have different values. **A logic OR operation is then performed on these boolean values BLa-f to generate the motion detection result**. In the above mentioned situation, the variable-field motion detection apparatus 800 can be regarded as a 6-field motion detector.

Id. at 5:40-59.
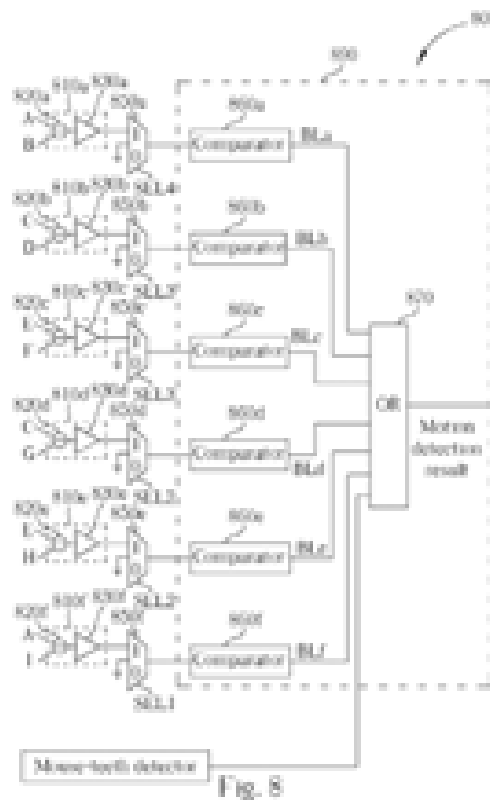
The '186 Patent, FIG. 8. FIG. 3 shows the spatial and temporal locations of pixels A-I and confirms that each of the calculated differences in FIG. 8 (A-B, C-D, E-F, C-G, E-H, and A-I) is a difference between temporal pixels, or in the case of C-D and E-F, a difference between a spatial pixel and a temporal pixel.

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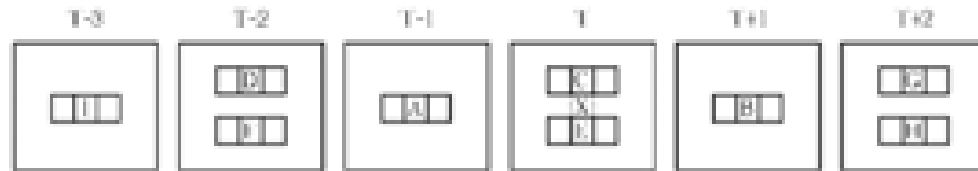
Fig. 3 Prior Art

86.   Mr. Holmes states that "The MDDi algorithm analyzes pixels from multiple fields, comparing values of pixels at similar spatial locations but different times, and makes interpolations using averages of known values." Holmes, Exh. D at 9. He cites no support for this statement. The '186 Patent does not support it because it does not describe interpolation techniques.

87.   Next, Mr. Holmes contends that the '329 Patent describes "MediaTek MDDi Motion Adaptive Deinterlacing Technology." However, Mr. Holmes' analysis is internally inconsistent on this point. At page 21 in the body of his report, Mr. Holmes states that patent protection for MDDi was pending in 2003. However, the face page of the '329 Patent indicates that it issued to Sarnoff Corporation in September 2002. According to U.S. Patent & Trademark Office Records, MediaTek did not acquire the '329 Patent until October 2004. Thus, Mr. Holmes has no basis for suggesting that the '329 Patent describes "MediaTek MDDi Motion Adaptive Deinterlacing Technology." Further, the '329 Patent merely describes a spatial interpolation technique for deinterlacing. No temporal fields or pixels are used. Motion adaptivity is also not addressed.

88.   The only portion of the '329 Patent cited by Mr. Holmes reads as follows:

> FIG. 4 is a diagram illustrating the relative spatial positions of a sequence of pixel-containing lines of a portion of one image field and a transformation thereof to remove the about one-half line spatial offset or misalignment that produces the aforementioned vertical jitter. A suitable transformation (or filtering) is one that interpolates, such as by simple averaging, the pixels of two adjacent lines of one of the two NTSC interlaced fields and substitutes the averaged line therefor. Where the

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                  UNITED STATES DISTRICT COURT
17   CENTRAL DISTRICT OF CALIFORNIA
18   WESTERN DIVISION

19
   OPLUS TECHNOLOGIES, LTD.,   CASE NO.: CV12- 5707 MRP (Ex)
20
                                      Hon. Judge Mariana R. Pfaelzer
21   Plaintiff,
                                      DEFENDANT VIZIO, INC.'S
22 v.   **NOTICE OF MOTION AND**
                                      MOTION FOR SUMMARY
23   **JUDGMENT OF INVALIDITY OF**
   SEARS HOLDINGS CORPORATION;   **U.S. PATENT NOS. 6,239,842 AND**
24 VIZIO, INC.,   **7,271,840**
25   Defendants.   DATE: September 9, 2013
26   TIME: 11:00 a.m.
                                     PLACE: Courtroom 12
27
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──
         NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF INVALIDITY

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NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT

1

2   PLEASE TAKE NOTICE that at 11:00 a.m. on September 9, 2013, or as soon

3   thereafter as counsel may be heard, Defendant VIZIO, Inc. ("VIZIO") will, and

4   hereby does, move this Court, the Honorable Mariana R. Pfaelzer presiding, for

5   Summary Judgment of Invalidity of U.S. Patent Nos. 6,239,842 and 7,271,840.

6   This motion is based upon this Notice of Motion and Motion, the

7   accompanying Memorandum of Points and Authorities, Statement of Uncontroverted

8   Facts and Conclusions of Law, Declarations of Charles C. Koole and Dr. Sheila S.

9   Hemami in support of this Motion and exhibits thereto, all pleadings and papers on

10   file in this action, and upon such other matters as may be presented to the Court at the

11   time of the hearing.

12   In accordance with the Court's standing order and Civil Local Rules, VIZIO

13   counsel certifies that they met and conferred with Oplus Technologies, Ltd.'s

14   ("Oplus") counsel prior to filing this Motion. On July 19, 2013, VIZIO counsel met

15   and conferred telephonically with Oplus counsel to discuss the grounds for this

16   Motion. Declaration of Charles C. Koole in Support of Defendant VIZIO, Inc.'s

17   Motion for Summary Judgment of Invalidity of U.S. Patent Nos. 6,239,842 and

18   7,271,840 at ¶ 10.

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20

21   Dated: July 29, 2013   Respectfully submitted,

22   By: /s/ Adrian M. Pruetz__

23   Adrian M. Pruetz
                                                 Charles C. Koole

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27   Steven R. Hansen
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NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF INVALIDITY

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NOTICE OF MOTION AND MOTION FOR SUMMARY JUDGMENT OF INVALIDITY

816903

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                   UNITED STATES DISTRICT COURT
15   CENTRAL DISTRICT OF CALIFORNIA
                       WESTERN DIVISION
16

17   OPLUS TECHNOLOGIES, LTD.,   CASE NO.: CV12-5707 MRP (Ex)

18   Plaintiff,   Hon. Judge Mariana R. Pfaelzer

19   v.   **MEMORANDUM OF POINTS AND
                                        AUTHORITIES IN SUPPORT OF
20   DEFENDANT VIZIO, INC.'S
     SEARS HOLDINGS CORPORATION;   MOTION FOR SUMMARY
21   VIZIO, INC.,   JUDGMENT OF INVALIDITY OF
                                        U.S. PATENTS NOS. 6,329,842 AND
22   7,271,840**
23   Defendants.
                                        DATE: September 9, 2013
24   TIME: 11:00 a.m.
                                        PLACE: Courtroom 12
25

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───
     MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY
                           JUDGMENT OF INVALIDITY

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1

$$\text{if } [(|B - E| < h_2) \text{ and } (|A - D| < h_2)]$$

2

$$\text{then } X = \frac{B + E}{2}$$

3

4 *Id.* Thus, Simonetti determines the value of missing pixels in a spatial field by

5 evaluating the claimed logical operations on linear combinations of the claimed

6 members of the Markush group.

7 **2. U.S. Patent No. 6,529,637 ("Cooper")**

8 U.S. Patent 6,529,637 ("Cooper") was filed on March 3, 1995 and thus is prior

9 art under 35 U.S.C. §§ 102(a)and (e). UF 34.

10 Cooper discloses a "spatial scan replication circuit," which provides a means

11 for filling "voids" between pixels, including the voids present in the "missing pixels"

12 of interlaced video. UF 35-36 and 41-42; Hemami Report at ¶ 131. In order to

13 determine the values of the missing pixels, Cooper evaluates "less than" and "or "

14 logical operations on several different absolute values of differences between spatial

15 pixel values.

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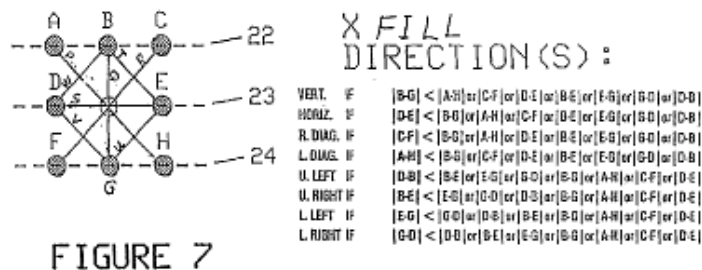
20 FIGURE 7

21 UF 43; Hemami Report at ¶¶ 131-132. Using the "less than" and "or" logical

22 operations, Cooper determines which pair of pixels on either side of a missing pixel

23 yields a difference with the smallest absolute value. Hemami Report at ¶ 133. That

24 pair of pixels is then used to determine the value of the missing pixels. *Id.*

25 **D. The '840 Patent**

26 The application for the '840 Patent was filed on October 31, 2002, and claims

27 priority to a single earlier-filed provisional application, Application No. 60/330,785,

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MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY
JUDGMENT OF INVALIDITY

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d.   Claim 14

The preamble and elements (a), (c), and (d) of independent claim 14 are substantially identical to the preamble and elements (a), (b), and (c) of claim 7, respectively.

The only additional limitation of claim 14 is element (b), which recites:

> (b) using a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of said pixels and **one temporal field** featuring temporal pixels with known values, located in said sequence of said fields for determining values of said missing pixels of said current spatial field;

UF 6 (emphasis added). In its infringement contentions, Oplus asserts that claim 14 can embrace the use of multiple temporal fields. UF 14; Hemami Report at ¶ 85**.** If the claim is applied as Oplus has applied it, Simonetti anticipates claim 14. Hemami Report at ¶¶ 85 and 92. As described above, Figure 1 of Simonetti discloses using temporal pixels V and W from two temporal fields (by averaging them) to determine the value of missing pixels. UF 17, 19, and 24-25; Hemami Report at ¶ 94.

For the foregoing reasons, Simonetti anticipates every asserted claim of the '842 Patent. Accordingly, the '842 Patent is invalid under 35 U.S.C. § 102.

2.   Cooper Includes Each Limitation of the Asserted Claims of the '842 Patent

The application for the Cooper patent was filed on March 3, 1995, more than three years prior to the December 18, 1998 filing date of the '842 Patent, and thus is prior art under both 35 U.S.C. §§ 102(a) and (e). UF 34.

a.   Claim 7 – "A method for deinterlacing an interlaced video format, the method comprising the steps of:"

While the parties stipulated that the preamble of Claim 7 is not limiting, Cooper describes a spatial scan replicator circuit for filling "voids" of an image, such as the missing lines in interlaced video, and describes the use of the invention with interlaced video. UF 40 ("From the above description it can be seen that it will be

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1 relatively easy to configure the invention to operate in time to <u>generate new lines,</u>

2 <u>rows</u> or new fields or frames of video.") (emphasis added); *see also* UF 41-42.

3   **(i)** **<u>"(a) receiving the interlaced video format feature a</u>**

4   **<u>sequence of fields of pixels to be de-interlaced"</u>**

5   Cooper discloses receiving interlaced video with a sequence of fields of pixels

6 to be deinterlaced. UF 41 ("Assuming, for another example, that FIG. 7 shows scan

7 lines 22 and 24 from an earlier field of interlaced scanning, and line 23 is from a

8 present field of scanning . . ."); *see also* UF 35-37, 40, and 42.

9   **(ii)** **<u>"(b) evaluating logical operations of linear</u>**

10   **<u>combinations of values . . . ."</u>**

11   As described above in Section IV.A.1.a(ii) *supra,* a Markush claim limitation,

12 including the "linear combinations of values" and "logical operations" Markush

13 groups of element (b), is met by the prior art if the prior art discloses one alternative

14 in the Markush group. *Fresenius,* 582 F.3d at 1298.

15   Cooper anticipates element (b) of claim 7 because it discloses evaluating

16 logical operations of linear combinations of known values of spatial pixels:
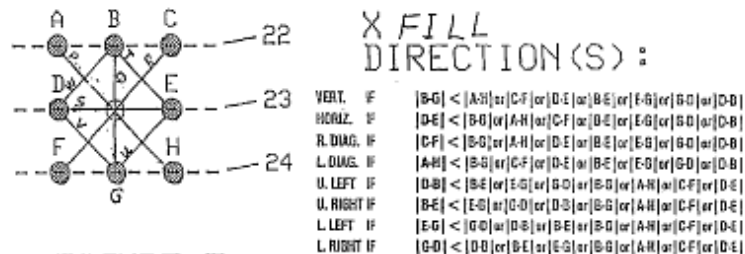
FIGURE 7

22 UF 43. Figure 7 shows eight sets of logical operations ("less than" and "or") of linear

23 combinations of spatial pixel values, including | B-G | < | A-H | or | C-F | or | D-E | or

24 | B-E | or | E-G | or | D-B |. *Id.*

25   Oplus' purported expert and the named inventor of the Cooper patent, J. Carl

26 Cooper, concedes that "the logical operations in Figure 7 are performed on the

27 absolute values of differences between two spatial pixels." UF 44. However, as with

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MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY
JUDGMENT OF INVALIDITY

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1 Simonetti, he attempts to distinguish his own patent from the asserted '842 Patent

2 claims by opining that "the absolute value of the difference between two spatial pixels

3 is not part of the '842 Patent's Markush group." Koole Decl., Exh. 8, Cooper Report

4 at ¶ 88. As mentioned above with respect to Simonetti, that contention is irrelevant.

5 The Court held that the linear combinations of values need not be specifically recited

6 in the Markush group as long as the reference "combin[es], in a linear manner, values

7 selected from the group" Order on MSJ at 10. Oplus also argued that the

8 manipulation of a linear combination of values "additional mathematical steps" is still

9 within the scope of the claims. UF 11 at 6 ("The '842 specification supports the view

10 that each of the members of the Markush group are values that include linear

11 combinations, either alone or in combinations with additional mathematical steps").

12 In support of this contention, Oplus proffered the opinions of a *different* purported

13 expert (Richard Ferraro), who stated that "[a]n absolute value of a linear combination

14 is still a linear combination because "[a]n absolute value of a linear combination can

15 be viewed as a linear combination followed by an absolute value operator, in other

16 words, $z = |ax+by|$." UF 12-13.

17   Thus, Cooper discloses step (b) of claim 7.

18   (iii) **"(c) deciding upon assignment of values to missing**
19   **spatial pixels according to results of said logical**
          operations."
20

21 Based on the results of the logical operations described above, Cooper

22 determines which pair of surrounding pixels is the most similar, and discloses

23 assigning either the value of one of the pair of similar pixels or an average of the two

24 pixels to the missing pixel X. UF 39. In either case, the logical operations of linear

25 combinations of spatial pixel values are used to determine the value of the missing

26 pixel X. *Id.*; *see also* Hemami Report at ¶¶ 131-133.

27   b. **Claim 8 – "The method of claim 7, wherein said**
          sequence of fields of pixels to be de-interlaced features a
28   **current spatial field featuring missing spatial pixels and**

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said spatial pixels with known values located in said sequence of said fields, and at least one temporal field featuring said temporal pixels with said known values located in said sequence of said fields."

As described in Cooper, the spatial pixels that are shown in Figure 7 can also refer to a sequence of fields that includes a current spatial field (line 23 in Figure 7) and a temporal field immediately prior to it (lines 22 and 24 in Figure 7). UF 41 and 43; Hemami Report at ¶ 139.

        c.   **Claims 9 [and 15] – "The method of claim 8 [14], wherein said [at least] one temporal field featuring said temporal pixels with said known values is selected from the group consisting of immediate previous said temporal field to said current spatial field located in said sequence of said fields, and immediate next said temporal field to said current spatial field located in said sequence of said fields."**

Cooper discloses performing the above-described technique using a current spatial field (containing line 23 in FIG. 7) and a single temporal field immediately prior to it (containing lines 22 and 24). UF 41 and 43; *see also* UF 38 ("Time replication is accomplished by using delays of **one picture period** (field or frame in a monitor device) or more to provide elements in the time axis, which may be used to fill temporal voids.") (emphasis added); Hemami Report at ¶ 139.

        d.   **Claim 14**

As described above, the only additional limitation present in claim 14 is element (b), which recites:

> (b) using a current spatial field featuring missing spatial pixels and said spatial pixels with known values located in said sequence of said pixels and **one temporal field** featuring temporal pixels with known values, located in said sequence of said fields for determining values of said missing pixels of said current spatial field;

MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY JUDGMENT OF INVALIDITY

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1   UF 6 (emphasis added). Cooper discloses using temporal pixels from a single

2   temporal field immediately prior to the spatial field to determine the value for missing

3   pixel X in Figure 7. UF 41 and 43; Hemami Report at ¶ 138.

4   For the foregoing reasons, Cooper anticipates every asserted claim of the '842

5   Patent. Accordingly, the '842 Patent is invalid under 35 U.S.C. § 102.

6   **B.   The Asserted Claims of the '840 Patent are Invalid Under 35 U.S.C.**

7   **§ 112, ¶ 1 for Lack of Written Description and Non-Enablement**

8   "The specification shall contain a written description of the invention, and of

9   the manner and process of making and using it, in such full, clear, concise, and exact

10   terms as to enable any person skilled in the art to which it pertains, or with which it is

11   most nearly connected, to make and use the same . . ." 35 U.S.C. § 112, ¶ 1.

12   "The test for sufficiency of a written description is whether the disclosure

13   clearly allows persons of ordinary skill in the art to recognize that the inventor

14   invented what is claimed." *Crown Packaging Tech., Inc. v. Ball Metal Bev.*

15   *Container Corp.,* 635 F.3d 1373, 1380 (Fed. Cir. 2011) (quoting *Ariad Pharms., Inc.*

16   *v. Eli Lilly & Co.,* 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)). "The disclosure

17   must reasonably convey to those skilled in the art that the inventor had possession of

18   the claimed subject matter as of the filing date." *Id.* "Possession means possession as

19   shown in the disclosure and requires an objective inquiry into the four corners of the

20   specification from the perspective of a person of ordinary skill in the art." *Id.*

21   "To be enabling, the specification of a patent must teach those skilled in the art

22   how to make and use the full scope of the claimed invention without 'undue

23   experimentation.'" *Magsil Corp. v. Hitachi Global Storage Techs., Inc.,* 687 F.3d

24   1377, 1380 (Fed. Cir. 2012) (citations omitted). "Enablement is determined as of the

25   *effective filing date* of the patent's application," *Alza Corp. v. Andrx Pharms.,* 603

26   F.3d 935, 940 (Fed. 2010) (emphasis added), which in the case of the '840 Patent is

27   October 31, 2001.

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MEMORANDUM OF POINTS AND AUTHORITIES IN SUPPORT OF VIZIO'S MOTION FOR SUMMARY JUDGMENT OF INVALIDITY

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              IN THE UNITED STATES DISTRICT COURT
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15   OPLUS TECHNOLOGIES, LTD.,   Case No. CV12-5707 MRP (E)

16   Plaintiff,   *Assigned to the Honorable Mariana R.*
                                      Pfaelzer
17   v.
                                      EXPERT REPORT OF J. CARL
18   SEARS HOLDINGS CORPORATION   **COOPER**
     and VIZIO, INC.,
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                     Defendants.
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     EXPERT REPORT AND DECLARATION OF J. CARL COOPER – CASE NO. CV 12-5707-MRP (E)

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1 said spatial pixels (it is not a minimum or standard deviation), absolute values of

2 differences between said averages of said known values of said temporal pixels

3 and said known values of said spatial pixels (it is not an average), said known

4 values of said spatial pixels (it does not use spatial pixels), and a plurality of

5 constants (it does not use a plurality of constants), which would be necessary to

6 provide the claimed "evaluating logical operations of linear combinations of

7 values".

8   51. $\left| V - W \right|$ is the absolute value of a difference between the values of

9 temporal pixels. Neither the values of temporal pixels, nor the absolute value of the

10 difference between the values of temporal pixels, is a member of the Markush

11 group. Thus, the disclosure of the interpolation process on page 234 of Simonetti is

12 not a disclosure of evaluating logical operations of linear <u>combinations</u> in which

13 the values are selected from the Markush group.

14   52.   The equation disclosed on p. 235 of Simonetti, $[(\left| B\text{-}E \right| < h2)$ and

15 $(\left| A\text{-}D \right| < h2)]$, is likewise not a disclosure of the evaluation of logical operations

16 of linear combinations of values selected from the Markush group. Both of the

17 linear combinations disclosed therein include a value which is the absolute value of

18 the difference between spatial pixels. Specifically, A, B, D, and E, all represent

19 spatial pixels. It must be noted that the absolute value of the difference between

20 spatial pixels, is by definition, a particular value in its own right. The absolute

21 value of the difference between the values of two spatial pixels is not necessarily

22 equivalent to the difference between those two pixels. The absolute value of the

23 difference between two spatial pixels is not one of the members of the Markush

24

EXPERT REPORT OF J. CARL COOPER– CASE NO. CV 12-5707-MRP (E)

group. Thus, the aforementioned equation disclosed on p. 235 of Simonetti is not a disclosure of evaluating logical operations of linear combinations of values selected from the Markush group of claims 7 and 14.

53.   The disclosure on p. 235 of Simonetti of (B+C+D+E)/4 is not relevant to the asserted claims. It is used to calculate the inclination of a border, not for "deciding upon assignment of values to missing spatial pixels according to results of said logical operations," as required by claims 7 and 14.

54.   The disclosures on p. 235-36 of Simonetti of:

- X=(C+P+D+L)/4
- X=(L+P)/2
- X=(L+M+N+P)/4
- X=(M+N)/2

are irrelevant because none of these equations involve the logical operators recited in claims 7 or 14.

55.   The disclosure on p. 236 of Simonetti of: $\left| F - Q \right| + \left| Q - S \right| < h2 < \left| N\text{-}P \right| + \left| P\text{-}D \right|$ is irrelevant because it includes as values, the absolute values of the differences between spatial pixels. As explained above, such values are not part of the Markush group.

56.   The disclosure on p. 236 of Simonetti of $\frac{B+2x+E}{4}$ is irrelevant because it does not include any of the logical operators recited in claims 7 or 14, and includes the missing pixel itself as a value, which is not a member of the Markush group.

-21-

EXPERT REPORT OF J. CARL COOPER– CASE NO. CV 12-5707-MRP (E)

A004466

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17   UNITED STATES DISTRICT COURT
18   CENTRAL DISTRICT OF CALIFORNIA
                     WESTERN DIVISION
19

20 OPLUS TECHNOLOGIES, LTD.,	CASE NO.: CV12- 5707 MRP (Ex)
21 Plaintiff,	Hon. Judge Mariana R. Pfaelzer
22 v.	**DECLARATION OF DR. SHEILA S. HEMAMI IN SUPPORT OF DEFENDANT VIZIO, INC.'S MOTIONS FOR SUMMARY JUDGMENT OF NONINFRINGEMENT AND INVALIDITY**
23	
24 SEARS HOLDINGS CORPORATION; VIZIO, INC.,	
25 Defendants.	
26	
27	DATE: September 9, 2013
	TIME: 11:00 a.m.
28	PLACE: Courtroom 12

DECLARATION OF DR. SHEILA S. HEMAMI ISO VIZIO'S MOTIONS FOR SUMMARY JUDGMENT OF
NONINFRINGEMENT AND INVALIDITY

816701

A004477

1   I, DR. SHEILA S. HEMAMI, declare that:

2   1.   I am currently a Professor of Electrical and Computer Engineering at

3 Cornell University in Ithaca, New York. I submit this declaration in support of

4 Defendant VIZIO, Inc.'s Motions for Summary Judgment of Noninfringement and

5 Invalidity of the patents-in-suit. If called and sworn as a witness, I could and would

6 testify to the matters set forth herein.

7   2.   Attached hereto as Exhibit A is a true and correct copy of the Expert

8 Report of Dr. Sheila S. Hemami Regarding the Invalidity of U.S. Patent Nos.

9 6,239,842 and 7,271,840, dated June 12, 2013. Exhibit A is my written report with

10 respect to the invalidity of U.S. Patent Nos. 6,239,842 (the "'842 Patent") and

11 7,271,840 (the "'840 Patent"), including my opinions and the bases therefor. All of

12 the facts and opinions contained in this report are true to the best of my knowledge. If

13 called, I am prepared to testify at deposition and trial regarding the subject matter of

14 this report.

15   3.   Attached hereto as Exhibit B is a true and correct copy of the Rebuttal

16 Expert Report of Dr. Sheila S. Hemami Regarding VIZIO's Noninfringement of U.S.

17 Patent Nos. 6,239,842 and 7,271,840, dated July 10, 2013. Exhibit B is my written

18 rebuttal report with respect to VIZIO's noninfringement of the '842 Patent and the

19 '840 Patent, including my opinions and the bases therefor. The exhibits that were

20 attached to this report as Exhibits 13A-13O have been concurrently filed

21 conditionally under seal as Exhibit B1. All of the facts and opinions contained in this

22 report are true to the best of my knowledge. If called, I am prepared to testify at

23 deposition and trial regarding the subject matter of this report.

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DECLARATION OF DR. SHEILA S. HEMAMI ISO VIZIO'S MOTIONS FOR SUMMARY JUDGMENT OF
NONINFRINGEMENT AND INVALIDITY

816701

Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

1   I declare under penalty of perjury of the laws of the United States of America

2   that the foregoing is true and correct.

3

4   Executed on this the 26ᵗʰ day of July, 2013 at Ithaca, New York.

5

6   *Sheila S. Hemami*

7   Sheila S. Hemami, Ph.D.

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Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

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DECLARATION OF DR. SHEILA S. HEMAMI ISO VIZIO'S MOTIONS FOR SUMMARY JUDGMENT OF NONINFRINGEMENT AND INVALIDITY

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MT5395

The World's first 120Hz iPTV & 3D TV solution

Overview

The MT5395 enables customers a true Full-HD 120Hz & connect/3D TV experience. It integrates high-quality Full-HD ME/MC technology, TCON/OD, Ethernet PHY, supporting Full-HD various video decoder and JPEG/MP3 playback.

Features

- 3-Frame 120Hz frame rate convertion
- Support MPEG1/2/4, H.264, VC-1, RMVB, AVS video decoder
- HDMI 1.4 receiver & support mandatory 3DTV input
- Sawless ATD architecture & TCON integration to reduce system BOM
- Integrate 720p H.264 encoder

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14   IN THE UNITED STATES DISTRICT COURT
            FOR THE CENTRAL DISTRICT OF CALIFORNIA
15   WESTERN DIVISION

16 | | |
     |---|---|
     | OPLUS TECHNOLOGIES, LTD., | Case No. CV12-5707 MRP (E) |
     | Plaintiff, | **JOINT STIPULATION RE: OPLUS' MOTION TO COMPEL DISCOVERY** |
     | v. | |
     | SEARS HOLDINGS CORPORATION and VIZIO, INC., | **Hearing Date: September 9, 2013**
 Time: 11:00 AM
 Courtroom:12 |
     | Defendants. | **Judge: Mariana R. Pfaelzer**
 Discovery Cutoff: May 15, 2013
 Expert Disc. Cutoff: August 7, 2013
 Pretrial Conf.: TBD
 Trial Date: TBD |

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JOINT STIPULATION RE OPLUS' MOTION TO COMPEL PRODUCTION OF DISCOVERY – CASE NO. CV12-5707-MRP (E)
820540.1

I.   INTRODUCTIONS

A.   OPLUS' INTRODUCTORY STATEMENT

On June 25, 2013, after a telephonic hearing, the Court issued Civil Minutes informing Plaintiff Oplus Technologies Ltd. ("Oplus") of the adequacy of its amended infringement contentions and permitting Oplus and VIZIO, Inc. ("VIZIO") to file motions of any kind. (Dkt. No. 144).

On July 3, 2013, counsel for Oplus wrote to counsel for VIZIO identifying numerous deficiencies in VIZIO's production of documents and responses to interrogatories. (Decl. Opatken, ¶ 2, Exhibit A). Therein, Oplus requested that VIZIO supplement all of its discovery responses and, at a minimum, withdraw objections based upon VIZIO counsel's September 18, 2012 letter. (Id.) That correspondence further identified Oplus' concern that VIZIO's document production was incomplete despite VIZIO's previous responses indicating that responsive documents would be provided. In an effort to expedite the discovery process in the midst of expert reports and close of expert discovery, Oplus attempted to narrow the issues in dispute by focusing on a limited set of discovery requests that are deemed particularly important. (Id.) Accordingly, Oplus identified VIZIO's responses to Interrogatories Nos. 1, 7 and 11 and Requests for Production Nos. 3-8, 23-25, 36, 44-47 and 60-66 as particularly time sensitive. (Id.) The correspondence specifically sought substantive supplemental responses and prompt production of documents and requested a response by July 12, 2013 so that Oplus could determine whether VIZIO would voluntarily comply with the requests or whether a motion to compel would be required. (Id.)

On July 10, 2013, VIZIO produced documents bearing production numbers VIZIO000440-3545. (Decl. Opatken, ¶ 3). While this production included various manuals and datasheets for some of the products specifically identified in Oplus' infringement contentions, VIZIO's production remains incomplete. (Id.)

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1   After close of business on Friday, July 12, 2013, counsel for Oplus reached

2 out again to VIZIO to reiterate its concern that VIZIO's discovery obligations had

3 not been fulfilled. (Decl. Opatken, ¶ 4, Exhibit B). That correspondence requested

4 that VIZIO indicate by Wednesday, July 17, 2013 whether it would voluntarily

5 comply with Oplus' requests; alternatively, Oplus requested a meet and confer

6 pursuant to Local Rule 37-1 on or before Monday, July 22, 2013.

7   Later that evening, VIZIO responded that it would agree to supplement its

8 responses to Interrogatories Nos. 1, 7 and 11 and Requests for Production Nos. 3-8,

9 44-47 and 60-66 but that it would not provide supplemental responses to Requests

10 for Production Nos. 23-25 or 36. (Decl. Opatken, ¶ 5, Exhibit C).

11   The parties engaged in a telephonic meet and confer on July 19, 2013 to

12 discuss the outstanding discovery issues. (Decl. Opatken, ¶ 6). On July 23, 2013,

13 VIZIO provided its (1) Second Supplemental and Amended Objections and

14 Responses to Oplus' Interrogatories Nos. 1, 7 and 11 and (2) Second Supplemental

15 and Amended Responses to Oplus' First Set of Requests for Production. Despite

16 this supplementation, VIZIO's discovery remained deficient. (Decl. Opatken, ¶ 7).

17   After review of the supplemental responses and determination that VIZIO's

18 discovery obligations remained unsatisfied, on August 1, 2013, Oplus again

19 corresponded with counsel for VIZIO in one last effort to amicably resolve the

20 parties' disagreement before seeking relief from the Court. (Decl. Opatken, ¶ 8,

21 Exhibit D). In an attempt to even further narrow the dispute and obtain only that

22 information most relevant given the current stage of proceedings, Oplus

23 specifically requested that VIZIO comply with its discovery obligations by

24 providing an identification of VIZIO's products since 2006, an identification of the

25 video processing chips utilized therein, and an identification of the annual sales for

26 those VIZIO products that use the relevant technology. (Id.) Oplus requested

27 confirmation by 5:00 p.m. Pacific that VIZIO would agree to this very limited

28 request. VIZIO has not responded as of the service of this Motion. (Id).

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1   Oplus has endeavored to heed this Court's urging that the parties attempt to

2   reach amicable resolution without burdening the Court. Unfortunately, Oplus'

3   efforts have been rebuffed and the parties have now lost a month without achieving

4   any resolution. VIZIO's refusal to provide the focused discovery necessary for

5   Oplus' case has forced Oplus to seek, reluctantly, relief from the Court.

6   As Oplus specifically stated during the meet and confer and again in its

7   August 1, 2013 correspondence, very narrow and minimally burdensome discovery

8   would benefit the parties as this case proceeds. After multiple letters and a meet

9   and confer, in an effort to obtain the most time-sensitive information from VIZIO,

10   Oplus has limited its current motion to compel as follows:

11   Oplus seeks adequate responses to Interrogatories Nos. 1 and 7 and

12   production of documents sufficient to respond to Requests for Production Nos. 8,

13   23, 24 and 25. Oplus proposes (as it did to VIZIO) that the most efficient manner

14   for providing this discovery would be for VIZIO to provide a list of all VIZIO

15   products from 2006 to the present and identify the video processing chipsets used

16   therein (see Interrogatory No. 1 and Request for Production No. 8). For those

17   products that do not utilize any accused technology (i.e., Faroudja DCDi,

18   MediaTek MDDi, or Silicon Optix HQV), the inquiry stops there; however, for

19   those VIZIO products that do use the accused technologies, Oplus proposes that

20   VIZIO provide annual financial information (i.e., sales by unit, sales by dollar

21   volume, profit, etc.) related thereto (see Interrogatory No. 7 and Requests for

22   Production Nos. 23, 24 and 25). As Oplus has made clear on several previous

23   occasions, the refusal to produce this information only causes uncertainty.

24   Production of the requested information, including sales data, will allow the parties

25   to meaningfully evaluate this case and, potentially, reach resolution.

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II.   AMENDED INTERROGATORIES NOS. 1 AND 7

A.   OPLUS' AMENDED INTERROGATORY NO. 1 TO VIZIO

AMENDED INTERROGATORY NO. 1:

Identify all Relevant Products by product number, trade name, and/or other designation.

VIZIO'S SECOND SUPPLEMENTAL OBJECTION AND RESPONSE:

VIZIO incorporates by reference each of the foregoing General Objections.

VIZIO objects to this Interrogatory on the grounds that this Interrogatory seeks information that is not relevant to this action or likely to lead to the discovery of admissible evidence.

VIZIO further objects to the definition of "Relevant Products" to the extent this definition has been superseded by the products and technologies accused in Oplus' June 14, 2013 Amended Infringement Contentions. VIZIO further objects to this definition to the extent it implies that any of VIZIO's products falling within Oplus' overbroad definitions are relevant in any way to this case.

Subject to and without waiver of the foregoing general and specific objections, VIZIO responds as follows:

VIZIO identifies the following products sold on or after December 1, 2005 that were specifically identified by Oplus in Oplus' June 14, 2013 Amended Infringement Contentions or that VIZIO was able to identify as using Silicon Optix HQV technology, Faroudja DCDi technology, or MediaTek MDDi motion adaptive deinterlacing technology:

P50HDTV10A, P50HDM, VM60P, GV46L, L13, JV50P, VP505XVT, VP504F, L42HDTV10A, GV42L, VW46L FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L, and VX37L.

VIZIO does not admit that any of the above-identified products are "relevant products." As set forth in detail in the July 10, 2013 Rebuttal Expert Report of Dr.

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Accordingly, Oplus requests that VIZIO simply identify all of its products since 2006 and indicate the video processing chipsets incorporated into each product.

2. VIZIO'S CONTENTIONS AS TO AMENDED INTERROGATORY NO. 1

Oplus claims to have discovered "nothing" in the six months following its service of Amended Interrogatory No. 1. Oplus has learned plenty. It has learned that the accused products and products incorporating the accused technologies were discontinued before Oplus filed its Complaint. It also learned that VIZIO had no knowledge of the patents-in-suit prior to that date. Oplus also learned that it and its purported "expert," D. Michael Holmes, had incorrectly asserted that many of the accused products included the allegedly infringing "technologies." Most importantly, Oplus learned that it has no viable infringement claims. As a result, Oplus now seeks to re-open discovery in the case and obtain discovery it never previously sought concerning every television VIZIO ever sold so it can find some way to accuse additional products and fabricate a large damages number. This motion to compel is nothing but a pretext, as VIZIO has fully responded to Oplus' Amended Interrogatory No. 1 in stating:

> VIZIO identifies the following products sold on or after December 1, 2005 that were specifically identified by Oplus in Oplus' June 14, 2013 Amended Infringement Contentions or that VIZIO was able to identify as using Silicon Optix HQV technology, Faroudja DCDi technology, or MediaTek MDDi motion adaptive deinterlacing technology:
>
> P50HDTV10A, P50HDM, VM60P, GV46L, L13, JV50P, VP505XVT, VP504F, L42HDTV10A, GV42L, VW46L

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1   FHDTV10A, L37HDTV, P42HDTV10A, VX32L, VW32L,

2   and VX37L.

3

4   VIZIO does not admit that any of the above-identified products are

5   "relevant products." As set forth in detail in the July 10, 2013 Rebuttal

6   Expert Report of Dr. Sheila S. Hemami Regarding VIZIO's Non-

7   infringement of U.S. Patent Nos. 6,239,842 and 7,271,840,

8   incorporated by this reference, none of these products are capable of

9   infringing either the '842 or '840 Patent claims asserted by Oplus and

10   many do not contain the technologies described by Oplus.

11 *See* VIZIO's Second Supplemental Response to Oplus' Amended Interrogatory

12 No. 1, restated above.

13   Now, solely because Oplus performed absolutely no due diligence before

14 filing this case, Oplus seeks to abandon the products and technologies it accused in

15 its Amended Infringement Contentions and makes the completely unfounded

16 assertion that VIZIO's full and specific response to this interrogatory **under oath**

17 is "suspect." On the basis of Oplus' completely unsupported accusation, Oplus

18 asks this Court to order VIZIO to "**identify all of its products since 2006 and**

19 **indicate the video processing chipsets incorporated into each product**" and

20 provide all "**documents sufficient to support that response,**" regardless of the

21 fact that Oplus has not accused any additional products of infringing in the nearly

22 two years this case has been pending. Contrary to what Oplus claims here, its own

23 blind "suspicion" does not make information relevant, and does not entitle Oplus to

24 engage in a pure fishing expedition:

25   Rule 26(b) provides several limitations on the scope of discovery. *See*

26   Fed.R.Civ.P. 26(b). Under Rule 26(b), for example, a court found that

27   requested information is not relevant to the pending action "if the

28   inquiry is based on the party's mere suspicion or speculation." *Micro*

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1   *Motion, Inc. v. Kane Steel Co.,* 894 F.2d 1318, 1326 (Fed.Cir.1990).

2   Here, Defendants have not persuaded the Court that they have a

3   reasonable basis to suspect that additional products allegedly infringe

4   the patents-in-issue. It appears that Defendants seek the Court's

5   permission to engage in a fishing expedition, so that they do not have

6   to conduct an investigation into whether or not additional products

7   infringe their patents. To deny such a request is not contrary to law.

8   *Samsung SDI Co., Ltd. v. Matsushita Elec. Indus. Co., Ltd.,* 2007 WL 4357552

9   (C.D. Cal. June 25, 2007) (Guilford, J.).

10   As the information Oplus seeks on this motion is not the information

11   requested in the foregoing Amended Interrogatory No. 1, there is nothing even to

12   compel. There is no authority, and Oplus cites none, that would support

13   compelling a party to produce information that was never requested during

14   discovery, especially months after discovery has closed. In addition, and as

15   addressed in the cases cited below, defendants in patent infringement cases are not

16   required to provide discovery on products that have not been accused of

17   infringement, so VIZIO has already gone beyond what the law requires is

18   searching for products with the "technologies" that Oplus accuses.

19   Oplus' Amended Interrogatory No. 1 states: "Identify all **Relevant Products**

20   by product number, trade name, and/or other designation." (emphasis supplied).

21   Oplus defined the term "Relevant Products" in its interrogatory request as: "(1) the

22   products identified in Oplus's Initial Infringement Contentions, served on August

23   9, 2012, (2) any products manufactured and/or sold from 2006 to the present that

24   utilize, embody or otherwise incorporate Silicon Optix HQV technology, (3) any

25   products manufactured and/or sold from 2006 to the present that utilize, embody or

26   otherwise incorporate Faroudja DCDi technology, and (4) any products

27   manufactured and/or sold from 2006 to the present that utilize, embody or

28   otherwise incorporate MediaTek motion adaptive de-interlacing technology."

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1   Declaration of Charles Koole ("Koole Decl."), Exh. 1 at 4. After Oplus served this

2   discovery, Oplus further narrowed its description of the MediaTek technology it

3   was accusing, stating:

4   No, Oplus is not taking the position that any motion adaptive de-

5   interlacing technology infringes the '842 patent… Rather, it is Oplus'

6   contention that any Vizio product using MediaTek MDDI motion

7   adaptive de-interlacing technology does infringe the '842 patent.

8   Koole Decl., Exh. 2 at 11.

9   Similarly, with respect to the '840 patent, Oplus stated:

10   As indicated above, we relied upon analysis by our consulting experts

11   in identifying his patent as being one which is believed to be practiced

12   by Mediatek in the accused Vizio televisions using MDDi motion

13   adaptive deinterlacing technology.[1]

14 *Id.* at 12.

15   After refusing for eight months to address the deficiencies in its

16 infringement contentions that led the Court to deny its earlier motion to compel

17 discovery, on June 14, 2013, Oplus filed and served Amended Infringement

18 Contentions, confirming that it was accusing eighteen VIZIO television models

19 alleged to use either "Silicon Optix HQV technology", "Faroudja DCDi

20 technology", or "MediaTek MDDi motion adaptive deinterlacing" technology. *See*

21 Koole Decl., Exh. 3 at Exh. A at 1, Exh. B at 1, Exh. C at 1, and Exh. D at 1.

22 Following service of the Amended Infringement Contentions, VIZIO responded to

23 Amended Interrogatory No. 1 after searching for the "Relevant Products" Oplus

24

25

26 [1] Notably, Oplus now mischaracterizes its contention as to "MediaTek MDDi motion adaptive de-interlacing throughout its portion of the Joint Stipulation as simply "MediaTek MDDi" in general.

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1 defined as televisions manufactured or sold from 2006 to the present that

2 incorporate the three technologies Oplus accused.

3   Contrary to Oplus' unfounded misrepresentations, ***VIZIO conducted a***

4 ***reasonable search and responded to this interrogatory, under oath, with exactly***

5 ***the specific information that Oplus requested. VIZIO also produced documents***

6 ***for each of the identified products, in response to Oplus' Document Request No.***

7 ***8, and these documents reflect the chipsets contained in the products.*** *See, e.g.,*

8 Koole Decl., ¶ 5, Exh. 4. These documents were produced on July 12, 2013, but

9 remarkably, Oplus did not bother to review them before bringing this motion. *Id.*

10 Otherwise, why has Oplus misleadingly said to this Court "[w]hy was VIZIO able

11 to identify the chipsets in its products in that [prior] case but not in this case?,"

12 when VIZIO has in fact produced documents that do show the chipsets in each of

13 the accused products? *Id.* Even worse, Oplus baselessly calls VIZIO's

14 interrogatory response under oath "suspect" and makes the demonstrably

15 untruthful statement that Oplus "was 100% successful, prior to filing this action

16 and with only publicly available information at its disposal, in identifying every

17 single VIZIO product that utilizes the accused technologies." *Nothing could be*

18 *further from the truth, as Oplus is well aware.* Of the eighteen television models

19 Oplus accused, one model was never even manufactured, another model was

20 discontinued well prior to 2006, and eleven of the remaining models do not even

21 use the accused technologies. *See* Declaration of Dr. Sheila S. Hemami in support

22 of VIZIO's Motions for Summary Judgment of Noninfringement and Invalidity

23 (Dkt. No. 150-12) at Exh. B (Dkt. No. 150-14) at ¶¶ 43, 110, and 180-190, excerpts

24 attached hereto as Koole Decl., Exh. 5. Accordingly, while VIZIO gave Oplus a

25 complete interrogatory response identifying (as Oplus requested) accused models

26 **and** models using accused technologies, it also made clear in its response that, with

27 respect to these products, "many do not contain the technologies described by

28 Oplus."

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1   Whether or not VIZIO is capable of investigating and identifying thousands

2 of video processing chips in every product VIZIO has sold since 2006, a task that

3 is certainly not without burden, as Oplus claims, does not make information about

4 ***all of the products VIZIO sells and that Oplus has not accused*** responsive to

5 Oplus' Amended Interrogatory No. 1 or in any respect the legitimate object of a

6 motion to compel. ***This is not the question that was asked or even that could***

7 ***have legitimately been asked, especially where Oplus has only accused a small***

8 ***number of products and has attempted to shift the burden entirely to VIZIO to***

9 ***identify other products for Oplus to accuse.*** This tactic has been rejected by every

10 court that has considered it.

11   Courts have consistently rejected discovery in patent infringement cases that

12 is not limited to the specific products accused of infringement. In *Samsung SDI*

13 *Co., Ltd. v. Matsushita Elec. Indus. Co., Ltd.,* 2007 WL 4328482 (C.D. Cal. May

14 17, 2007), *aff'd* 2007 WL 4357552 (C.D. Cal. June 25, 2007) (emphasis supplied),

15 the court held, consistent with the other cases it cites:

16   The Samsung Entities have cited numerous case authorities indicating

17   that **discovery in patent infringement cases should be limited to**

18   **the specific products or services accused of infringement.** *See,*

19   *e.g., Convolve, Inc. v. Compaq Computer Corp.,* 223 F.R.D. 162, 165

20   (S.D.N.Y.2004) (denying plaintiff Convolve's motion to compel

21   Compaq to produce documents related to any AAM disk drive, rather

22   than just the two specifically accused Compaq disk drives, and

23   affirming special master's finding that Convolve's request was overly

24   broad because it was not limited the accused disk drives); *Funai Elec.*

25   *Co., Ltd. v. Orion Elec. Co., Ltd.,* 2002 WL 1808419, at *3, *9

26   (S.D.N.Y. Aug.7, 2002) (denying Orion's motion to compel Funai to

27   respond to document requests relating to "technical aspects of current

28   Funai products that are not related to any claim in this case" and

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1   denying Orion's motion to compel Funai to respond to certain

2   document requests seeking information "relating to 'non-accused

3   Orion products' "); *Alpex Computer Corp. v. Nintendo Co., Ltd.,* 1988

4   WL 87511, at *5 (S.D.N.Y. Aug.16, 1988) (denying Alpex's request

5   for Nintendo to produce information concerning non-accused games,

6   explaining that "[t]he theory that this information may be relevant to

7   the computation of a reasonable royalty on the infringing products is

8   too speculative on this record"); *Caritas Technologies, Inc. v.*

9   *Comcast Corp.,* Case No. 2:05-CV-00039, E.D. Tex., Feb. 10, 2006

10   Order, Dkt. 63, at pp. 8, 13-14 (denying Caritas' motion to compel

11   production of documents relating to non-accused services, explaining

12   that Caritas could only discover information related to the accused

13   service); *Data Treasury Corp. v. First Data Corp.,* Case No. 5:03-

14   CV-00039, E.D. Tex., Oct. 30, 2006 Order, Dkt. 279, at p. 5 (denying

15   DataTreasury's motion to compel discovery related to *"un-accused*

16   *products, systems, processes, and financials,"* explaining that it is

17   improper for DataTreasury to request "information about any

18   products, services, and/or systems that are not properly accused

19   instrumentalities of the patents in-suit"); *cf Polycom, Inc. v. Codian,*

20   *Ltd.,* 2007 WL 194558, at *3 (E.D.Tex. Jan. 22, 2007) (permitting

21   discovery where accused devices were specifically identified by

22   model name and number in plaintiff's preliminary infringement

23   contentions). **Defendants have failed to cite any contrary**

24   **authority**.

25   Here, despite this Court generously allowing Oplus to serve and file

26   Amended Infringement Contentions more than a year and a half into this case, on

27   June 14, 2013, Oplus only accused 18 VIZIO products of infringement, and eleven

28   of those products do not even use the technologies Oplus accused of infringing.

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1   Declaration of Dr. Sheila S. Hemami in support of VIZIO's Motions for Summary

2   Judgment of Noninfringement and Invalidity (Dkt. No. 150-12) at Exh. B (Dkt.

3   No. 150-14) at ¶¶ 43, 110, and 180-190, excerpts attached hereto as Koole Decl.,

4   Exh. 5. Moreover, VIZIO informed Oplus well prior to Oplus amending its

5   infringement contentions, in April 2013, that none of the television models Oplus

6   accused were on sale at the time of or after the filing of Oplus' Complaint in

7   December 2011. Koole Decl., Exh. 6 at 9-11. Oplus was again informed by

8   VIZIO, in early May 2013, at the depositions of VIZIO officers Robert Brinkman

9   and Kenneth Lowe, that the television models and technologies Oplus accused had

10   been discontinued by VIZIO long ago. Koole Decl., Exh. 7, Lowe Dep. at 83:24-

11   84:4; 85:20-86:20; Koole Decl., Exh. 8, Brinkman Dep. at 68:1-9; 68:13-25; 71:6-

12   14; 71:24-72:3; 74:16-75:20; 75:24-76:10; 77:4-22; 78:11-79:20; 79:21-80:16; and

13   80:24-81:25.

14   Accordingly, Oplus' feigned surprise that not all the television models it

15   accused were even on sale post-2006, and none were on sale post-filing of the

16   Complaint in December 2011, is simply an artifice to encourage this Court to re-

17   open fact discovery, which closed on May 15, 2013. With both fact and expert

18   discovery now closed, and summary judgment motions pending, Oplus asks this

19   Court (through the ruse of this alleged motion to compel) to allow it to search "the

20   universe of potential products" for new products to accuse. Oplus' proposal that

21   VIZIO identify every one of the products it sold from 2006 to the present and their

22   chipsets, so that Oplus can decide whether to accuse them of infringement, is

23   exactly the kind of burden-shifting fishing expedition this Court (among others

24   cited above) has rejected and has told Oplus (at least twice) that it would not allow:

25   The Court: Well, now you have got to come forward right away with

26   infringement contentions.

27   Mr. Opatken: That's correct, your honor.

28   The Court: And then you get to take discovery based on them.

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2   The Court: …The only thing I'm telling you is that **I'm not going to permit**

3   **you to just ask them about everything they do, widely.**

4   Mr. Opatken: And I understand that, your Honor, but, obviously, there's

5   some gray area --

6   The Court: Certainly, there is. The only -- but there's a caveat about this.

7   **You can't file a complaint for patent infringement and then say, 'Well,**

8   **now let's see if there is any. And let's see where it is.'**

9   Mr. Opatken: I agree, your Honor.

10   The Court: All right. Well, that's what I'm talking about.

11 Koole Decl., Exh. 9, July 24, 2012 Scheduling Conference Transcript at 12:15-19

12 and 14:18-15:4 (emphasis added).

13 The Court also advised Oplus:

14

15   The relationship between infringement contentions and discovery is hardly

16   estranged. Infringement contentions were originally devised as a

17   streamlined mechanism to replace the series of interrogatories defendants

18   would have propounded in their absence. The purpose was to provide

19   structure to the entire discovery process. It was also intended to require the

20   plaintiff to crystallize its infringement theory early in the case and adhere to

21   it once disclosed.

22

23 *See also* Koole Decl., Exh. 10, April 3, 2013 Order Denying Motion to Compel

24 (Dkt. No. 121) at 1.

25   As numerous other courts have likewise held, "the burden is on Plaintiff, not

26 Defendants, to search for and identify infringing products to the extent possible

27 based on public information." *Am, Video Graphics, L.P v. Elec. Arts, Inc.*, 359 F.

28 Supp 2d. 558, 560 (E.D. Tex. 2005) ("The Patent Rules demonstrate high

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1   expectations as to plaintiff's preparedness before bringing suit, requiring plaintiffs

2   to disclose their preliminary infringement contentions before discovery has even

3   begun."); *Theranos, Inc.* v. *Fuisz Pharma LLC*, 2012 U.S. Dist. LEXIS 172160 at

4   *6 (N.D. Cal. Nov. 30, 2012) ("By arguing that [Defendant's] information is not

5   publicly-available and by offering to amend the Contentions only after discovery

6   has occurred, [Plaintiff] is attempting to ignore their obligations and shift the

7   burden to [Plaintiff]. Such a tactic is improper.").

8   Now, more than a year and a half into this case, and after the Court accepted

9   Oplus' Amended Infringement Contentions as adequate and VIZIO responded to

10 Oplus' discovery requests based on them, Oplus seeks to jettison those contentions.

11 With fact and expert discovery closed and summary judgment motions pending,

12 Oplus wants to start over by impermissibly investigating **all** of VIZIO's products

13 for a new set of products and technologies to accuse. Such an abuse should not be

14 permitted. The Eastern District of Texas recently addressed a situation where, late

15 in the case as here, the plaintiff sought to add additional products to the case based

16 on the defendants' discovery disclosures. Holding that the plaintiff cannot shift the

17 burden to the defendants to identify products that incorporate accused

18 technologies, the court stated:

19

20   It may be conceivable that even acting diligently, Plaintiff would have

21   failed to identify some of the products that incorporate the accused

22   technology. Instead, Plaintiff found the efforts to identify products to

23   be expensive and cumbersome and instead disclosed only a few

24   products in its original contentions, then demanded that Defendants

25   identify the remaining products that incorporate the accused

26   technology. This is contrary to Plaintiff's responsibility under the

27   local patent rules and demonstrates a lack of diligence by Plaintiff.

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1   *Keranos, LLC v. Silicon Storage Tech., Inc.,* No. 2:13-cv-17, slip. op. at 7 (E.D.

2   Tex. Aug. 5, 2013), attached hereto as Koole Decl., Exh. 11.

3   Here, VIZIO has already taken the additional step that is Oplus' burden, and

4   responded to Amended Interrogatory No. 1 by identifying the "Relevant Products"

5   **defined by Oplus** as products that were either accused by Oplus or incorporated

6   the technologies accused by Oplus. In contrast, Oplus has never provided any

7   discovery that would support its infringement claims, instead retaining a

8   completely unqualified "expert" who rendered a report so unsupported by any

9   admissible evidence that Oplus refused to allow him to be deposed during the

10 expert discovery period that closed August 7, or even prior to bringing this motion,

11 in clear violation of Fed. R. Civ. P. Rule 26(b)(4)(a). Koole Decl., ¶ 13, Exh. 12.

12   Oplus should not be permitted to now use the pretext of this purported

13 "motion to compel" an answer to an interrogatory that has been answered, to seek

14 wide ranging discovery **it never requested and is not entitled to** of every product

15 VIZIO sells — products Oplus has not accused of infringing the Oplus patents and

16 has no basis to accuse of infringing the Oplus patents. It is also important to note

17 that Oplus knows and has admitted ***in this case*** that there is no information to

18 support its infringement claims in VIZIO's files. Koole Decl., Exh. 13, Oplus'

19 Reply to Response to Motion to Transfer and Centralization of Actions Pursuant to

20 28 U.S.C. § 1407 at 3 ("Plainly, none of the discovery to be had about the technical

21 details of such accused products can be obtained in California."); Koole Decl.,

22 Exh. 14, Oplus' Response to VIZIO's Motion to Sever and Transfer Claims

23 Against VIZIO and Stay Claims Against Sears (Dkt. No. 41) at 5 ("Vizio is not a

24 manufacturer. It has no knowledge or involvement in design and manufacturing . .

25 . [I]t is Vizio that has no understanding of how its products were designed,

26 developed or work."); *see also id.* at 3 ("Suppliers (all of whom are based in China

27 and Taiwan) decide what designs to use and how to use them . . . Vizio doesn't

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1   select or approve the video processing circuitry, for example, which [Oplus claims]

2   is used to practice the patents at issue.").

3   　　　But Oplus' goal has never been to discover information that would confirm

4   infringement. Oplus failed to seek information from suppliers who could actually

5   explain to Oplus how their video processing chips worked, to avoid creating a

6   record that its infringement claims lack merit. Oplus refused to allow its alleged

7   infringement expert, D. Michael Holmes, to be deposed during the expert

8   discovery period and also decided not to take the deposition of VIZIO's expert, Dr.

9   Sheila Hemami, apparently for the same reason. Koole Decl., ¶ 13, Exh. 12. As

10   Dr. Hemami's report makes clear, Holmes provided a sham expert report,

11   unsupported by anything but inadmissible hearsay, that does not reflect an

12   understanding of how any of the accused technologies work and that does not

13   support Oplus' allegations of infringement against VIZIO. Declaration of Dr.

14   Sheila S. Hemami in support of VIZIO's Motions for Summary Judgment of

15   Noninfringement and Invalidity (Dkt. No. 150-12) at Exh. B (Dkt. No. 150-14).

16   　　　Oplus' outrageous demand that this Court allow Oplus to now rewrite its

17   Amended Interrogatory No. 1 as a request for information about **all** VIZIO

18   products sold over the past eight years, and then order VIZIO to produce such

19   information, is contrary to law and an abuse of the discovery process, and should

20   be denied.

21   　　　**B.**　　**OPLUS' AMENDED INTERROGATORY NO. 7 TO VIZIO**

22   **AMENDED INTERROGATORY NO. 7:**

23   　　　State the annual sales and gross profits by product for each of the Relevant

24   Products and any additional products identified in response to Interrogatory No. 1,

25   dating back to the year when each product was first publicly introduced in the

26   United States or 2006 (whichever is later).

27   **VIZIO'S SECOND SUPPLEMENTAL OBJECTIONS AND RESPONSE:**

28   　　　VIZIO incorporates by reference each of the foregoing General Objections.

-22-

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allow Oplus to formulate a damage calculation based thereupon. If VIZIO believes that Oplus' damage model is excessive, a rebuttal damages report or motions *in limine* might be appropriate.

Accordingly, Oplus simply requests that VIZIO respond to Interrogatory No. 7 by identifying the requested sales information for each VIZIO product that uses one of the accused technologies (as determined through VIZIO's supplementation of its response to Interrogatory No. 1).

2.   VIZIO'S CONTENTIONS AS TO AMENDED INTERROGATORY NO. 7

All of Oplus' asserted claims are method claims. As described further below, because VIZIO had no knowledge of the patents in suit and discontinued the accused products prior to the filing of the Complaint, Oplus cannot possibly establish indirect infringement as a matter of law. Its only potential infringement claim is for direct infringement based on VIZIO's *de minimis* "use" of a sample unit of each accused product. Thus, as also described further below, Oplus has no basis for obtaining damages based on sales of the accused products as a matter of law. Again, Oplus seeks to compel discovery far beyond the scope of its Amended Interrogatory 7, to which VIZIO fully responded, and discovery that is irrelevant and inadmissible as a matter of law.

Oplus's Amended Interrogatory No. 7 states:

State the annual sales and gross profits by product for each of the **Relevant Products** and any additional products identified in response to Interrogatory No. 1, dating back to the year when each product was first publicly introduced in the United States or 2006 (whichever is later).

-28-

1   Documents sufficient to show the types, versions and models of all Relevant

2   Products planned, designed, made, used, sold, imported or offered for sale by

3   Defendant since 2006.

4   **VIZIO'S SUPPLEMENTAL OBJECTIONS AND RESPONSE:**

5   VIZIO incorporates by reference each of the foregoing General Objections.

6   Subject to and without waiving the foregoing General Objections

7   incorporated in this response, VIZIO has produced all documents sufficient to

8   respond to this request.

9   ## 1.   OPLUS' CONTENTIONS AS TO REQUEST NO. 8

10   On July 10, 2013, Oplus received, for the first time, approximately 3,000

11   pages of documents that discuss the operation of certain VIZIO products. For

12   example, VIZIO produced (1) Service Manuals (which it previously represented to

13   Oplus and the Court that it did not have (*see* June 25, 2013 Hearing Tr. at 7:8-15,

14   attached as Exhibit 16 to the Koole Declaration)), (2) User Manuals (which it

15   previously represented, improperly, to the Court that it has already produced (*see*

16   June 25, 2013 Hearing Tr. at 6:19-25, attached as Exhibit 16 to the Koole

17   Declaration), (3) Datasheets/Specification sheets, (4) Quick Start Guides, and (5)

18   User Guides. This production, however, lacks any information relating to other

19   products not already specifically accused by Oplus in its Infringement Contentions.

20   VIZIO has been less than forthright with its discovery obligations and Oplus

21   is left to wonder whether VIZIO has produced *all* relevant documents or whether

22   VIZIO has simply produced those documents that it wants to produce. Moreover,

23   review of those documents demonstrates the incompleteness of VIZIO's

24   production. The numerous objections and vague responses provide no further

25   guidance. In fact, at previous meet and confers, counsel for VIZIO stated that they

26   had not even undertaken to ascertain whether certain documents exist. If VIZIO

27   will not take its obligations seriously enough to search for responsive documents,

28

-36-

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    Oplus Technologies, Ltd.

12   IN THE UNITED STATES DISTRICT COURT
                 FOR THE CENTRAL DISTRICT OF CALIFORNIA
13   WESTERN DIVISION

14

OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707 MRP (E)
15		
Plaintiff,	*Assigned to the Honorable Mariana R. Pfaelzer*
16	v.	
17		**DECLARATION OF GABRIEL I. OPATKEN IN SUPPORT OF**
SEARS HOLDINGS CORPORATION and VIZIO, INC.,	**JOINT STIPULATION RE: OPLUS' MOTION TO COMPEL**
18 | | **DISCOVERY** |
19 | Defendants. | |

20

21

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23

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25

1 I, Gabriel I. Opatken, declare as follows:

2 1. I am an attorney with the law firm of Niro, Haller & Niro and

3 admitted *pro hac vice* on behalf of Plaintiff Oplus Technologies, Ltd. ("Oplus") in

4 the above-captioned action. I make this declaration on personal knowledge.

5 2. On July 3, 2013, I served a correspondence to Ms. Pruetz, counsel for

6 VIZIO, identifying numerous deficiencies in VIZIO's production of documents

7 and responses to interrogatories. Attached hereto as Exhibit A is a true and correct

8 copy of that correspondence.

9 3. On July 10, 2013, VIZIO produced a disc containing documents

10 bearing production numbers VIZIO000440-3545. These documents included

11 various service manuals, user manuals, datasheets/specification sheets, quick start

12 guides, and user guides. Nonetheless, VIZIO's production of documents remained

13 incomplete.

14 4. After close of business in Chicago on Friday, July 12, 2013, I again

15 served a correspondence to Ms. Pruetz, counsel for VIZIO, reiterating Oplus'

16 concern that VIZIO's discovery obligations had not been fulfilled. Attached hereto

17 as Exhibit B is a true and correct copy of that correspondence.

18 5. Shortly thereafter on the same day, Ms. Pruetz, counsel for VIZIO,

19 served correspondence stating that VIZIO would agree to supplement its responses

20 to Interrogatories Nos. 1, 7 and 11 and Requests for Production Nos. 3-8, 44-47

21 and 60-66 but that it would not provide supplemental responses to Requests for

22 Production Nos. 23-25 or 36. Attached hereto as Exhibit C is a true and correct

23 copy of that correspondence.

24

25

- 1 -

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> Re: _Oplus Technologies v. VIZIO_: VIZIO's Discovery Responses

Dear Ms. Pruetz:

The purpose of this letter is to follow up regarding numerous deficiencies in VIZIO's production of documents and responses to interrogatories. Per the Court's Minute Order of June 25, 2013 (Dkt. No. 144), Oplus intends to pursue a motion to compel discovery of the outstanding document requests and interrogatories. In an effort to reach amicable resolution without seeking intervention by the Court, we write to request that VIZIO provide supplemental responses to Plaintiff's Amended Interrogatories (Nos. 1-20) and Plaintiff's First Set of Requests for Production of Documents.

The Court's Minute Order confirms that Plaintiff's Amended Infringement Contentions are adequate, thus mooting VIZIO's objections to discovery based on its September 18, 2012 letter. Accordingly, Oplus requests that VIZIO supplement all responses to interrogatories and requests for production that rely upon said objection. With respect to the other responses that do not rely upon the mooted objection, Oplus believes that VIZIO's responses are inadequate. For example, numerous responses state that VIZIO will produce documents responsive to a request; however, review of VIZIO's document production reveals that VIZIO has not produced any responsive documents. In such instances, Oplus requests that VIZIO either provide all of the requested documents or affirmatively state that no such documents exist.

A005600

July 3, 2013
Page 2

While Oplus expects prompt and thorough supplementation of all of VIZIO's responses to discovery, the specific requests identified below are believed to be particularly time sensitive and Oplus requests that VIZIO prioritize its supplementation accordingly.

Interrogatory No. 1: This interrogatory seeks identification of "all Relevant Products by product number, trade name, and/or other designation." Despite providing a supplemental response, VIZIO has still refused to provide the requested information. In refusing to provide a response or provide documents pursuant to Rule 33(d), VIZIO objects based on the Court's April 3, 2013 Order. That objection is now moot and Oplus again requests that VIZIO provide an adequate response. Additionally, during the telephonic hearing, you stated: "Well, we will go back and look to see – I think, you know, if they're talking about what chips are in the television, that kind of high-level information may be available." (Transcript at 8:21-24). Oplus believes that such information (and more) does in fact exist, as evidenced by the public record in the *TLC* case where VIZIO produced information regarding chip identification on a per-product basis. While Oplus does not contend that this high-level information is the only information responsive to this request, we believe that providing such information would be a good start and the parties can revisit the issue later as necessary.

Interrogatory No. 7: This interrogatory requests that VIZIO "[s]tate the annual sales and gross profits by product for each of the Relevant Products and any additional products identified in response to Interrogatory No. 1." Again, VIZIO objected based on the Court's April 3, 2013 Order. In light of the telephonic conference and the Court's Minute Order, Oplus requests prompt supplementation of VIZIO's response to this interrogatory.

Interrogatory No. 11: This interrogatory requests that VIZIO "[s]tate and describe in detail the design and development history of each of the Relevant Products." VIZIO objected to this interrogatory based on the Court's April 3, 2013 Order. In light of the telephonic conference and the Court's Minute Order, Oplus requests prompt supplementation of VIZIO's response to this interrogatory as well. As an additional point, and as discussed at the telephonic conference, it is believed that VIZIO has access to numerous manuals, including service manuals, which should have been produced by VIZIO.

As a general parameter with respect to the foregoing, in the event VIZIO chooses to provide documents pursuant to Rule 33(d), Oplus requests that VIZIO "specify[] the records that must be reviewed, in sufficient detail to enable [Oplus] to locate and identify them as readily as [VIZIO] could" in accordance with the Rule.

Request for Production Nos. 3-8: These requests generally seek documents sufficient to describe the operation of the Relevant Products. VIZIO objected to each of these requests based on its September 18, 2012 letter. In light of the Court's Minute Order, that objection is now improper and Oplus requests prompt supplementation of VIZIO's responses and production of responsive documents. As discussed above with respect to Interrogatory No. 11, it is believed that VIZIO has access to numerous manuals, including service manuals, that are responsive to these requests.

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July 3, 2013
Page 3

  Request for Production Nos. 23-25: These requests generally seek documents sufficient to show the volume of Relevant Products made, used, sold, imported, licenses and/or offered for sale by VIZIO; the unit and dollar volume of VIZIO's sales of the Relevant Products; and VIZIO's financial reports. Again, VIZIO objected based upon its September 18, 2012 letter, an objection rendered improper by the Court's Minute Order. Accordingly, Oplus requests prompt supplementation of VIZIO's responses to these requests and production of responsive documents.
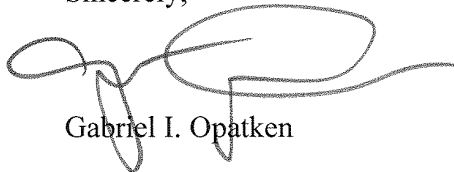
  Request for Production No. 36: This request seeks VIZIO's license agreements that relate in any way to the Relevant Products. As with the prior requests, VIZIO objected based on its September 18, 2012 letter. In light of the Court's Minute Order, please promptly supplement VIZIO's response to this request and produce responsive documents.

  Request for Production Nos. 44-47 and 60-66: These requests generally seek documents that comprise and/or relate to correspondence and/or other communications relating to the patents-in-suit, this lawsuit, Oplus, or the technologies at issue. VIZIO objected that these requests were premature based on VIZIO's September 18, 2012 letter. Oplus requests, in light of the Court's Minute Order, that VIZIO promptly supplement its responses to these requests and produce responsive documents.

  While Oplus identifies the foregoing requests as high priority given the stage of these proceedings, Oplus expects timely supplementation of VIZIO's responses to the remainder of the requests within a reasonable time thereafter. Although we do not want to dictate a hard deadline for production, we would appreciate VIZIO's diligent speed in attempting to resolve all of its discovery deficiencies – most importantly those identified specifically herein – and would hope that VIZIO could provide supplementation and production of documents sometime in July.

  In order to ensure that these issues are resolved in a timely manner, please respond by July 12, 2013 and indicate whether VIZIO is willing to voluntarily comply with Oplus' requests or whether Oplus will be required to seek relief from the Court.

Sincerely,

Gabriel I. Opatken

cc/Counsel of Record

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Re: *Oplus Technologies v. VIZIO*: VIZIO's Discovery Responses

Dear Ms. Pruetz:

I write in furtherance of my correspondence dated July 3, 2013. Therein, we reiterated numerous deficiencies in VIZIO's production of documents and responses to interrogatories. We further requested that VIZIO supplement its responses to Oplus' outstanding Requests for Production of Documents and Amended Interrogatories. While we did not attempt to set a firm deadline for supplementation, we requested a response by July 12, 2013 indicating whether VIZIO would be willing to voluntarily comply with Oplus' requests.

We received, on July 10, 2013, a disc containing documents bearing production numbers VIZIO000440-3545. That production appears to include five general categories of documents: (1) Service Manuals[1]; (2) User Manuals[2]; (3) Data Sheets/Specification Sheets; (4) Quick Start Guides; and (5) User Guides. While we appreciate your production of these documents, VIZIO's discovery to date continues to suffer from lingering deficiencies.

---

[1] These appear to be at least some of the Service Manuals that VIZIO previously represented it did not have. (See, June 25, 2013 Hearing Tr., at 7:8-15).
[2] These appear to be at least some of the User Manuals that VIZIO previously represented it had already produced. (See, id. at 6:19-25).

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July 12, 2013
Page 2

As a preliminary matter, VIZIO has still not supplemented (or agreed that it will supplement) its responses to Oplus' outstanding Interrogatories and Requests for Production. As set forth in greater detail in our July 3, 2013 correspondence, VIZIO's current responses rely on objections that have been deemed moot by the Court. Accordingly, we restate our request that VIZIO agree to supplement its responses in a timely manner.
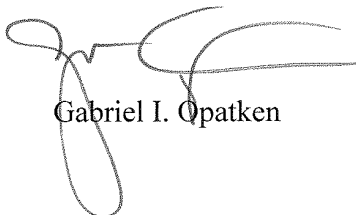
Specifically with respect to VIZIO's responses to Oplus' Amended Interrogatories, we note that VIZIO continues to rely on Rule 33(d) without sufficiently identifying responsive documents. To the extent VIZIO intends to supplement its responses and maintain its reliance on Rule 33(d), we again request that VIZIO comply with the Rule in full.

Additionally, VIZIO's recent production of documents notably does not include many responsive documents. For example, the production does not include documents relating to all models of VIZIO's Relevant Products; in fact, it appears that the production does not even include documents relating to all VIZIO televisions specifically identified in Oplus' Infringement Contentions. Moreover, review of the production reveals that VIZIO has still not produced any documents relating to unit volumes of sales, revenues generated from sales, or any other information related to damages. Likewise, VIZIO's production does not include any license agreements as requested. Finally, VIZIO's production does not include any communications with third parties as re-requested in our previous correspondence.

Again, the requests set forth in this correspondence are not exhaustive and are not intended to supersede the previous specific requests or all other outstanding discovery – Oplus maintains that VIZIO has a continuing obligation to promptly supplement all of its discovery under the Federal Rules. Rather, the present goal is to facilitate prompt supplementation of the most time-sensitive information.

While we have not attempted to set a firm deadline for this production, we would still appreciate a response to our July 3, 2013 correspondence indicating whether VIZIO intends to voluntarily comply with Oplus' requests. If VIZIO is willing to voluntarily comply with Oplus' requests in a timely manner, please so indicate by Wednesday, July 17, 2013. If, however, VIZIO will force Oplus to seek relief from the Court, we request a conference pursuant to Local Rule 37-1 on or before Monday, July 22, 2013. If unable to reach agreement without intervention by the Court, Oplus will seek an order from the Court compelling the production of all outstanding discovery including, but not limited to, the issues set forth herein and in previous correspondence.

Regards,

Gabriel I. Opatken

cc/Counsel of Record

A005605

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Re: _Oplus Technologies v. VIZIO_: VIZIO's Discovery Responses

Dear Ms. Pruetz:

I write in furtherance of our prior correspondences dated July 3, 2013 and July 12, 2013 and our meet and confer on July 19, 2013. We thank you for providing VIZIO's Second Supplemental and Amended Objections and Responses to Oplus' Amended Interrogatories (Nos. 1, 7 and 11) and VIZIO's Second Supplemental and Amended Responses to Oplus' First Set of Requests for Production on July 23, 2013. Our review of VIZIO's supplemental responses, however, indicates that the issues we discussed during our July 19, 2013 meet and confer have not been adequately resolved.

Interrogatory Nos. 1 & 7 and Requests for Production Nos. 8, 23, 24 &25

Oplus' Interrogatories seek: (1) Identification of all Relevant Products by product number, trade name and/or other designation; and (7) Identification of the annual sales and gross profits for each of the Relevant Products and any additional products identified in response to Interrogatory No. 1 from 2006 to the present.

August 1, 2013
Page 4

271(a)."); *id.* at 774-75 ("[A] method claim is not directly infringed by the sale of an apparatus even though it is capable of performing only the patented method. The sale of the apparatus is not a sale of the method. A method claim is directly infringed only by one practicing the patented method."); *see also Embrex, Inc. v. Service Eng'g. Corp.,* 216 F.3d 1343, 1350 (Fed. Cir. 2000) ("[B]ecause the sale of devices that may be used to practice a patented method cannot infringe without proof of direct infringement, SEC's offers to sell its machines cannot supply adequate evidentiary support for a compensatory damage award. Because the only cognizable infringement in this case is the testing and those tests were not shown to cause any loss of profits to Embrex, this court vacates the district court's award of $500,000 in direct damages.").

Oplus also claims, without more, that "Vizio also induces and contributes to infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein the direct infringement is performed by the end users of the accused Vizio televisions." *See* Oplus' June 14, 2013 Amended Infringement Contentions at Exh. A at 1, Exh. B at 1, Exh. C at 1, and Exh. D at 1. However, both contributory infringement and inducement of infringement require, at a minimum, actual knowledge of the patents that are allegedly infringed. *Synqor, Inc. v. Artesyn Techs., Inc.,* 709 F.3d 1365 (Fed. Cir. 2013) (citing *Global-Tech Appliances, Inc. v. SEB S.A.,* 131 S. Ct. 2060, 2068, 179 L. Ed. 2d 1167 (2011)) ("Liability for induced or contributory infringement under § 271(b) or (c) requires 'knowledge that the induced acts constitute patent infringement.' This includes, in part, actual 'knowledge of the existence of the patent that is infringed.'"). Oplus has not established any notice of the asserted patents prior to the filing of its Complaint on December 1, 2011, and VIZIO had no such notice. Thus, because each of the products identified in response to Oplus' Amended Interrogatory No. 1 were sold prior to the filing of Oplus' Complaint, and before VIZIO had any knowledge of the asserted patents, sales information for these products is irrelevant to Oplus' indirect infringement claims on this ground alone. Other compelling reasons why Oplus cannot show any basis for seeking sales information for the accused products based on its completely unsupported indirect infringement claims are set forth in detail in the July 10, 2013 Rebuttal Expert Report of Dr. Sheila S. Hemami Regarding VIZIO's Noninfringement of U.S. Patent Nos. 6,239,842 and 7,271,840, incorporated by this reference.

Had VIZIO completed the meet and confer process as Oplus' counsel requested on July 26, 2013, VIZIO's Motion for Summary Judgment would not have been necessary on many of your asserted grounds. For example, Oplus intended to propose a narrowing of the issues of this case by withdrawing claims for damages resulting from indirect infringement prior to the filing of the Complaint (based on your current representations that VIZIO was unaware of the patents in suit prior to that date). Additionally, Oplus was, and remains, willing to clarify that it was only seeking damages related to VIZIO's direct infringement through its *use* of infringing products from 2006 through the present. While the process may be slightly more complicated given VIZIO's recent motions, Oplus still intends to clarify these issues accordingly.

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                    IN THE UNITED STATES DISTRICT COURT
13   FOR THE CENTRAL DISTRICT OF CALIFORNIA
                            WESTERN DIVISION
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OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707 MRP (E)
Plaintiff,	**NOTICE OF MOTION TO COMPEL**
v.	**Hearing Date: September 9, 2013**
SEARS HOLDINGS CORPORATION and VIZIO, INC.,	**Time: 11:00 AM** **Courtroom: 12** **Judge: Mariana R. Pfaelzer**
Defendants.	**Discovery Cutoff: May 15, 2013** **Expert Disc. Cutoff: August 7, 2013** **Pretrial Conf.: TBD** **Trial Date: TBD**

A005793

NOTICE OF MOTION

PLEASE TAKE NOTICE that at 11:00 a.m. on September 9, 2013, Plaintiff Oplus Technologies, Ltd. ("Oplus") will, and hereby does, move this Court, the Honorable Mariana R. Pfaelzer presiding, to compel Defendant VIZIO, Inc. to respond to discovery and produce the documents requested in the concurrently filed Joint Stipulation Re: Oplus' Motion to Compel Discovery.

This Motion to Compel is based on the Joint Stipulation Re: Oplus' Motion to Compel Discovery, the Declaration of Gabriel I. Opatken, the files of this case and such other evidence and argument that may be heard by the Court.

In accordance with this Court's standing orders and the Civil Local Rules, particularly L.R. 37, Oplus counsel certifies that the parties conducted a telephonic meet and confer on July 19, 2013 to discuss the discovery issues presented in Oplus' Motion to Compel and cooperated in the preparation of the Joint Stipulation.

Respectfully submitted,

/s/ *Gabriel I. Opatken*

Gabriel I. Opatken (*Pro Hac Vice*)
NIRO, HALLER & NIRO

Attorneys for Plaintiff Oplus Technologies, Ltd.

A005794

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13 Oplus Technologies, Ltd.

14   IN THE UNITED STATES DISTRICT COURT
            FOR THE CENTRAL DISTRICT OF CALIFORNIA
15   WESTERN DIVISION

16 OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707-MRP (Ex)
17 Plaintiff,	Honorable Judge Mariana R. Pfaelzer
18 v.	**OPLUS' RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF INVALIDITY**
19 SEARS HOLDINGS CORPORATION and VIZIO, INC.,	
20 Defendants.	Date: September 9, 2013 Time: 11:00 a.m.
21	Place: Courtroom 12

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RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF INVALIDITY -
CASE NO. CV12-5707-MRP (Ex)

1   spatial pixels." However, in the disclosure at issue, none of the values which make

2   up the linear combination are the "known values of said spatial pixels."

3   Specifically, in the equation $|B-E| < h_2$, it is irrelevant that "B" and "E" are

4   known values of spatial pixels. This is because there is no evaluation of logical

5   operation regarding the values "B" and "E." Rather, the evaluation of the logical

6   operation, less than, involves the value, "$|B-E|$." "$|B-E|$," the absolute value of

7   the differences between two spatial pixels, is a value in its own right. (Ferri Decl. ¶

8   4, Ex. 3 at ¶ 52). For example, suppose the value of "B" was 2 and the value of "E"

9   was 4. The difference between those two values would be -2. But the absolute

10 value of the difference between "B" and "E" is not equivalent to this. It is +2.

11 Thus, the value of "$|B-E|$" is different from the combination of the values of

12 spatial pixels B and E. The value "$|B-E|$" is not a member of the Markush group,

13 and therefore, this disclosure within Simonetti is not a disclosure of evaluating

14 either *multiple* logical operations or linear combinations involving values only

15 from the Markush group. Simonetti does not disclose these limitations, which are

16 found in both independent claims (claims 7 and 14). Thus, Simonetti cannot

17 anticipate the asserted claims of the '842 Patent.

18   **B.**   **THE COOPER PATENT DOES NOT USE THE VALUES OF THE MARKUSH GROUP**

19

20   The Cooper patent does not disclose the limitation of "evaluating logical operations of linear combinations of values selected from the group consisting

21

22 of...." As with Simonetti, VIZIO does not clearly address how the Cooper patent is

    supposed to disclose this limitation.

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1   The Cooper patent discloses comparisons of the absolute values of the

2 differences between the values of two spatial pixels. For example, Cooper

3 discloses "│B-G│<│A-H│," where "B," "G," "A," and "H" represent the value of

4 spatial pixels. The values which comprise the relevant linear combinations are *the*

5 *absolute values* of the differences between two spatial pixels. The absolute value

6 of the differences between two spatial pixels is not part of the Markush group, and

7 thus disclosure does not satisfy the relevant limitation.

8   VIZIO's motion fails to identify what it contends are the relevant linear

9 combinations it claims the Cooper reference discloses. Instead, VIZIO simply tries

10 to argue that the limitation is met because equations are disclosed that involve the

11 values of spatial pixels (e.g. "B," "G," "A," and "H"). However, Cooper does not

12 disclose an evaluation of logical operations relating simply to the value of spatial

13 pixels. Cooper only discloses the evaluation of logical operations relating to the

14 *absolute values* of the differences between two spatial pixels. This is a unique

15 value that is separate from the value of spatial pixels. Cooper only discloses a

16 determination of whether the *absolute value of the difference* between B and G is

17 less than the *absolute value of the difference* between A and H. The absolute value

18 of the differences between the value of spatial pixels is not a member of the

19 Markush group of claim 7, and thus the relevant limitation is not disclosed in

20 Cooper. (Ferri Decl. ¶ 4, Ex. 3 at ¶¶ 88-89). And while VIZIO will likely try to

21 argue in reply that other portions of the Cooper patent not discussed in its motion

22 (e.g., Ferri Decl. ¶ 8, Ex. 7, Table at col. 12) show mathematical operations of the

23 kind called for by the '842 Patent claims, the evidence of record shows that that

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1   chose not to raise prior to the Markman hearing. Thus, VIZIO's new motion for

2   summary judgment of noninfringement should be denied.

3

4   Respectfully submitted,

5   */s/ Arthur A. Gasey*
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                    IN THE UNITED STATES DISTRICT COURT
14   FOR THE CENTRAL DISTRICT OF CALIFORNIA
                         WESTERN DIVISION
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16 OPLUS TECHNOLOGIES, LTD.,   Case No. CV12-5707 MRP (E)

                        Plaintiff,   *Assigned to the Honorable Mariana R.
17   Pfaelzer*

        v.
18   **DECLARATION OF DANIEL R.
                                         FERRI IN SUPPORT OF OPLUS'
    SEARS HOLDINGS CORPORATION   RESPONSE TO VIZIO, INC.'S
19 and VIZIO, INC.,   MOTION FOR SUMMARY
                                         JUDGMENT OF INVALIDITY**
20   Defendants.

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                                  A005853

1   9.   Attached hereto as Exhibit 8 is a true and correct copy of U.S. Patent

2 No. 5,568,568 ("the '568 Patent").

3   10.   Attached hereto as Exhibit 9 is a true and correct copy of U.S. Patent

4 No. 6,141,461 ("the '461 Patent").

5

6   I declare under penalty of perjury under the law of the United States of

7 America that the foregoing is true and correct.

8   Executed on this 19th day of August 2013 at Chicago, Illinois.

9

10   Respectfully submitted,

11   /s/ *Daniel R. Ferri*
                         Daniel R. Ferri (*Pro Hac Vice*)

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                    IN THE UNITED STATES DISTRICT COURT
14   FOR THE CENTRAL DISTRICT OF CALIFORNIA
                            WESTERN DIVISION
15

16 OPLUS TECHNOLOGIES, LTD.,   Case No. CV12-5707-MRP (Ex)

17   Plaintiff,   Honorable Judge Mariana R. Pfaelzer

18   v.   **OPLUS' RESPONSE TO VIZIO,
                                       INC.'S MOTION FOR SUMMARY
19 SEARS HOLDINGS CORPORATION   JUDGMENT OF
    and VIZIO, INC.,   NONINFRINGEMENT**

20   Defendants.
                                       [CONFIDENTIAL VERSION]
21

22   Date: September 9, 2013
                                       Time: 11:00 a.m.
23   Place: Courtroom 12

24

25
    RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT -
                          CASE NO. CV12-5707-MRP (Ex)

                               A006221

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21   [2] VIZIO's refusal to participate in discovery is nothing new. In the previous patent infringement case referenced above, there were two separate hearings on very similar discovery disputes as

22   here – e.g., VIZIO's refusal to identify which of its products use the infringing technology. In the end, VIZIO was ordered to produce a list of all of its model numbers sold since 2005, to identify

23   the chips used in each of those products, and to produce the sales information relating to the products on that list, because as Judge Cox put it to VIZIO "Somebody has got to go first. And

24   you know what? It's you." (Ferri Decl. ¶ 7, Ex. G at 30; see also Ferri Decl. ¶ 6, Ex. F).

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RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT -
CASE NO. CV12-5707-MRP (Ex)

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CASE NO. CV12-5707-MRP (Ex)

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RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT -
CASE NO. CV12-5707-MRP (Ex)

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RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT -
CASE NO. CV12-5707-MRP (Ex)

1

2

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    /s/ Arthur A. Gasey

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RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY JUDGMENT OF NONINFRINGEMENT -
CASE NO. CV12-5707-MRP (Ex)

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                IN THE UNITED STATES DISTRICT COURT
14   FOR THE CENTRAL DISTRICT OF CALIFORNIA
                         WESTERN DIVISION
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16 OPLUS TECHNOLOGIES, LTD.,	Case No. CV12-5707-MRP (Ex)
17 Plaintiff,	Honorable Mariana R. Pfaelzer
18 v.	**DECLARATION OF DANIEL R. FERRI IN SUPPORT OF OPLUS'**
19 SEARS HOLDINGS CORPORATION and VIZIO, INC.,	**RESPONSE TO VIZIO, INC.'S MOTION FOR SUMMARY**
20 Defendants.	**JUDGMENT OF NONINFRINGEMENT**

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1   http://www.eettimes.com/document.asp?doc_id=1273583&print=yes, last accessed

2   on August 19, 2013.

3   24.   Attached hereto as Exhibit X is a true and correct copy of the Expert

4   Report of J. Carl Cooper served on July 10, 2013.

5   I declare under penalty of perjury under the law of the United States of

6   America that the foregoing is true and correct.

7   Executed on this 19th day of August 2013 at Chicago, Illinois.

8

9   Respectfully submitted,

10   /s/ *Daniel R. Ferri*
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- 6 -
DECLARATION OF DANIEL R. FERRI IN SUPPORT OF OPLUS' RESPONSE TO VIZIO, INC.'S MOTION FOR
SUMMARY JUDGMENT OF NONINFRINGEMENT -
CASE NO. CV12-5707-MRP (Ex)

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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD., Plaintiff, v. SEARS HOLDINGS CORPORATION and VIZIO, INC., Defendants.	Case No. CV12-5707 MRP (E) *Assigned to the Honorable Mariana R. Pfaelzer* **EXPERT REPORT AND DECLARATION OF D. MICHAEL HOLMES**

6. Video Plane:
1. Support video capture and over scan
2. Flesh tone management
3. Gamma/anti-Gamma correction
4. Color Transient Improvement (CTI)
5. 2D peaking
6. Saturation/hue adjustment
7. Brightness and contrast adjustment
8. Black and White level extender
9. Adaptive Luma/Chroma management
10. Automatic detect films or video sources
11. 3:2/2:2 pull down source detection
12. The MT5380 support bob mode de-interlace.
    The MT5381 support 1366 width motion-adaptive de-interlace.
    The MT5382 supports maximum 1920 width motion-adaptive de-interlace. The entire
    MT538x family supports excellent low angle image processing.

http://www.smarthelpcenter.com/manuals/Vizio/VIZIO_VX32L_VW32L_HDTV20A_AUO_LPL_Samsung_Service_Manual_C.pdf at 7-5.

33.   The claim charts of Exhibits D and E explain the basis for my opinion that various MDDi enabled MediaTek chips families that are used by Vizio infringe the '842 and '840 patents. The analysis supporting my conclusion is summarized as follows:

34.   Since the end of 2003, MediaTek appears to have touted its MDDi features in a variety of different video processor chips. (See http://www.myce.com/news/MediaTek-introduces-DivX-Pro-chip-with-DRM-for-on-line-movies-7340/, December 12, 2003 press release discussing "MediaTek's patent-pending scan algorithm, the MDDi (media direct de-interlacing) technology"). The MDDi feature appears to have been subsequently patented. (See http://www.prnewswire.com/news-releases/mediatek-releases-worlds-first-120hz-soc-solutions-for-high-end-smart-tv-136719823.html, noting "MediaTek's patented MDDi™ de-interlace solution"). The use of the MDDi solution is reflected in a variety of chip model numbers used in Vizio televisions, including

-21-

VIZIO

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HOME / NEWS AND PRESS / **REVIEWS**

NEWS & PRESS

OVERVIEW   NEWS   PRESS   REVIEWS   AWARDS

VIZIO Co-Star GoogleTV Media Player Reviewed
Monday, April 1, 2013

HomeTheaterReview.com

By Andrew Robinson

April 1, 2013

Performance

This part of the review isn't going to be your usual chatter about high-frequency performance or soundstage depth, as that's not what the Co-Star is really about. What I want to get at is how well or not-so-well the Co-Star improves the home entertainment experience. Starting with simple broadcast viewing, you can carry it out in one of two ways. First, and arguably the fastest, is to simply hit the guide button on the remote, which brings up your service provider's guide much as you would if the Co-Star were not installed. This is fine, and it works well if you know what you're after, but it isn't really why you have a device such as the Co-Star. Hitting the large center-mounted V button on the remote is the other way of going about it. Hitting the V button will pull up a side-mounted menu filled with small, square icons. Each icon represents an app that is either pre-installed or that you have downloaded. At the top of the menu, you'll find an empty space marked "Favorites" (you can rename it if you wish). Selecting one of the apps and holding down the OK button will pull up a pop-up menu asking if you wish to add that App to your favorites, uninstall it, etc. The icon or app that looks like a multi-colored calendar is the PrimeTime Guide. This is where things get really cool.

Read More

VIZIO E701i-A3 Review & Check Price for VIZIO E701i-A3 at Find Review Today
Wednesday, March 20, 2013

PR Web

March 20, 2013

FindReviewToday.com has published a VIZIO E701i-A3 review which includes the product's features, its benefits and its disadvantages. Included in the review are other useful information about VIZIO's flagship model LED HDTV like this price, a link to check its price from different sites online and more reviews to help consumers decide on their purchase of their next HDTV.

VIZIO BLOG ;)

Stay connected to the latest VIZIO info on events, brand ambassadors, photos and videos.

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According to the writers of FindReviewToday.com, the VIZIO E701i-A3 is one of the best HDTVs to watch movies, sporting events and music videos with its one-of-a-kind features. Its RAZOR LED technology, large and wide screen, colorful video and stunning audio makes it an ideal HDTV model for a large family or for an avid movie buff.

Read More

VIZIO CT15-A4 Ultrabook Review

Wednesday, March 13, 2013

LaptopLookOver.com

By Laptop Look Over

March 13, 2013

If you're tired of your outdated and bulky laptop then it's about time for you to get upgraded to newer and lighter alternatives like the VIZIO CT15-A4. The VIZIO has everything you've been looking for in a portable ultrabook laptop. It's lightweight, razor thin, and has a sophisticated silver design on a durable anodized aluminum construction.

The VIZIO features a stunning 15.6 inch display that produces high definition images for your viewing pleasure. It also includes a premium SRS sound for crystal clear sound production that's ideal when listening to music and other media. In addition, this ultrabook is also fast in performance and efficiently designed for all your daily tasks. Once you've experienced what this awesome computer has to offer, you'll soon realize that good things also come in small packages.

Read More

VIZIO SB4021M-A1 Home Theater Soundbar

Thursday, February 28, 2013

PCMag.com

By Will Greenwald

February 28, 2013

Soundbars with wireless subwoofers can certainly sound impressive, because that big 15-pound block you keep next to your couch can make the room shake without much effort. Because of this, when shopping for a system, it's easy to ignore the soundbar speaker itself, which gives you all of the audio above approximately 100Hz. Dialog, music, sound effects, and anything that isn't completely bass-driven suffers if the soundbar doesn't do its job. Unfortunately, the Vizio SB402M-A1 is proof of that. Its subwoofer is capable and its $229.99

(direct) price tag. Also, its 14-inch soundbar just doesn't have enough reach or

power to give the midrange and treble response enough impact.

Design

The soundbar itself is 40.1 inches wide and 4.1 inches high on its removable
silver-colored feet, and measures only 2.1 inches deep. It weighs a svelte 4.8
pounds, and can easily be placed in front of your TV or mounted on a wall. The
front is covered with a cloth grille interrupted in the middle by a glossy plastic
rectangle with a silver Vizio logo and a blue LCD display. The ends are capped
with silver-colored trim that give the soundbar a slightly more distinguished look.
The top of the soundbar holds Power, Input, and Volume Up/Down buttons flush
against a glossy plastic shell. The back holds the power port facing outward and a
USB port, analog input, coaxial input, and optical input set facing right or down
inside recessed areas, which are designed to make the ports accessible when the
soundbar is mounted on a wall.

The wireless subwoofer is nondescript and black, measuring 12.8 by 8.5 by 11.3
inches (HWD) and weighing 10.9 pounds. The front, top, and back are black
plastic, while the sides are covered in cloth grilles. A side-firing port sits on the
back. It comes pre-paired with the soundbar, so all you have to do is plug it in,
make sure it's within about 30 feet of the soundbar, and enjoy the bass.

The remote is large, chunky, and simple, measuring 4.4 inches long and 0.6
inches thick. It holds Power, Input, Mute, and Menu buttons, plus a direction pad
that doubles as playback and volume control. The remote isn't backlit, but it's
easy enough to use blindly.

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The E420i also offers internet streaming features. Using the Vizio Internet Apps
menu, you can access an abundance of internet streaming content, as well as the
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USB and Skype - But No DLNA
Access to audio, video, and still image files from direct insertion of USB flash
drive-type devices. Also, another device you can connect to the E420i's USB port

is the Vizio Co-Star Stream Apps TV video streaming device. It also allows you make video phone calls via Skype.

It must also be pointed out that while the E420i can connect to your home network for the purposes of accessing the internet, it is not DLNA compatible. This means that this set cannot be used to access audio, video, or image content stored on network-connected PCs or media servers.

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Vizio Co-Star: Vizio Mashes Up With Google, FTW?
Friday, February 22, 2013

GStyleMag.com

By Analie

February 22, 2013

When I bought my TV a few years back, I went with a regular 1080p LCD with 120 Hz. I could not afford to spend the extra hundreds on the new Smart TV's that were coming out (prices have since reduced drastically). But at the time I didn't think it was necessary or that I will really need it. With a laptop and a HDMI cable I should be able to stream content easily, right? Eh, not so much.

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VIZIO Thin+Light CT15: Something New And Edgy
Thursday, February 14, 2013

AnandTech.com

By Vivek Gowri

February 14, 2013

Last year was very eventful in the notebook world. Beyond the UX upheaval brought on by Windows 8 and the blurring of the line between notebooks and tablets, we've seen two high-profile entrants to the realm of notebook PC hardware, Razer and Vizio. Both are well established tech companies that have experience shipping high-quality products in their respective gaming and HDTV market areas. This type of thing doesn't happen very often, and while it's not on the level of Microsoft jumping into the PC hardware ring, it's an interesting trend to note.

Contrary to Razer's focused, single-device launch targeting the gaming market, Vizio jumped into the mainstream PC game head first, debuting three different products—an Ultrabook, a notebook, and an all-in-one. Given Vizio's history of

delivering solid, digestible … HDTV … nTalk … these systems was … pretty highly anticipated, with cutting edge industrial design and high-grade style on a relative budget, but definitely had some usability issues at launch. After the Windows 8 update though, it seemed like some of those issues would be fixed and the post-holiday sales have made them very tempting options in the ultraportable space. Today we'll be looking at their Thin+Light Ultrabook, which is available in 14" and 15.6" sizes. Ours is the top-spec CT15, which comes with a 15.6" 1080p IPS display panel, an ultra-low voltage Core i7, 4GB of memory, and a 256GB solid state drive.

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VIZIO Co-Star Google TV Player Review

Monday, February 11, 2013

TechnologyTell.com
By Chris Schaaf
February 11, 2013

Google TV can best be described as one of the best innovations that no one really asked for, or quite knows what to do with. In an age of iDevices, consumers are used to intuitive, simple interfaces, and devices whose purpose is pretty clear from the get-go. But when you first power up a Google TV box, you can't help but wonder just what you're supposed to do with it. Dig a little deeper and you find that, yes, it is an awfully powerful system that just hasn't matured yet. That, combined with some seriously iffy hardware support, hasn't done much to keep the Google TV ecosystem relevant, but Vizio is one of the manufacturers hoping to keep the dream alive with its Vizio Co-Star.

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Test Report: VIZIO E601i-A3 LCD HDTV

Monday, February 11, 2013

SoundAndVisionMag.com
By Al Griffin
February 11, 2013

Black Friday — the day after Thanksgiving, and the biggest shopping day of the year. It's a day when hordes of Americans head out to the local mall or Walmart, ready to fill their carts and, if necessary, take you out should you stand in the way between them and a good deal. TV maker Vizio has traditionally released a new model or two just in time for Black Friday — often at prices well below the norm for sets in their category/screen size. The E601i-A3, a 60-inch edge-lit LED LCD, was one such special, having reportedly sold for $699 on that day — a price that is, well, insane. But now that the E601i has bobbed back to a more real-world, though still very affordable, $999, it's time to check out how it stacks up against

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VIZIO SB4021M-A1 Review: VIZIO's Sound Bar Is a Solid Pick -- For Now

Wednesday, February 6, 2013

CNET

By Matthew Moscovciak

February 6, 2013

If sound bars are the ultimate "good enough" home audio solution, the Vizio SB4021M-A1 ($270 street price) feels like the typical good-enough sound bar. It's solid in just about every respect, with a sleek design, a good remote, and above-average sound quality. At the same time, it lacks a single standout quality that would put it head and shoulders above its competitors. It may be easier to enthusiastically recommend a less well-rounded sound bar that either looks or sounds fantastic, but there's something to be said for a balanced product.

The big hesitation about the SB4021M-A1 is its lack of built-in Bluetooth, which is about to become a much more common feature for new 2013 sound bars coming out in the spring. If you need to buy a sound bar now, the SB4021M-A1 is one of the better options currently on the market, but if you can wait just a few months, you'll have a better crop of sound bars to choose from.

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Vizio E420i 42-inch LED/LCD Smart TV - Review
Internet Streaming, DLNA, USB, Menu System, Pros/Cons, Final Take

About.com Rating ★★★★☆

By Robert Silva, About.com Guide

(Continued from Page 1)

[Compare Prices ›]

Internet Streaming

The E420i also offers internet streaming features. Using the Vizio Internet Apps menu, you can access an abundance of internet streaming content, as well as the ability to add more via the Yahoo Connect TV Store. Some of the accessible services and sites include: Amazon Instant Video, Crackle TV, Vudu, HuluPlus, M-Go, Netflix, Pandora, and YouTube.

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Viz o E420i Smart LED/LCD TV - Photo - Front View
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USB and Skype - But No DLNA

Access to audio, video, and still image files from direct insertion of USB flash drive-type devices. Also, another device you can connect to the E420i's USB port is the VIZIO XCV100 Internet Apps TV Video Camera (Compare Prices) which allows you make video phone calls via Skype.

It must also be pointed out that while the E420i can connect to your home network for the purposes of accessing the internet, it is not DLNA compatible. This means that this set cannot be used to access audio, video, or image content stored on network-connected PCs or media servers.

Ease of Use

The E2420i provides an extensive onscreen menu system to make adjustments and access content. The menu system is composed of two parts: a TV and Apps menu that runs along the bottom of the TV screen, which allows short cut access to the setting menus and selected internet and network media content (see supplementary photo), as well as a more comprehensive menu system that can be displayed on the left hand side of the screen (see supplementary photo).

Both menu display options are accessible via the side mounted control or provided IR remote. I found the menu system easy to navigate, including the ability to add new streaming services using the included Yahoo Connected TV Store.

However, although the remote control is compact and fits in an average-size hand well, I did feel that it wasn't always easy to use, especially in a darkened room, as it has very small buttons and is not backlit.

What I Liked About The Vizio E420i

1. Easy to unpack and set-up.

2. Even black level response across screen area.

3. Extensive video setting

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options.

4. Provides good selection of internet streaming options.

5. Good motion response.

6. Electronic version of complete user manual included in menu selection.

Viz o E420i Smart LED/LCD TV - Photo - Ethernet - Compos te - Component - RF Connections

Photo © Robert Silva - Licensed to About.com

7. Non-glare Matte Screen

8. Input and output connections well-placed, spaced, and labeled.

8. Inclusion of both analog and digital audio outputs.

10. The remote control provides quick access buttons for Amazon Instant Video, Netflix, and M-Go internet streaming services.

What I Didn't Like About The Vizio E420i

1. Channel access using direct numerical entry is slow.

2. Long start-up time.

3. Shared component/composite video input. This means you cannot have component and composite video sources connected to the E420i at the same time.

4. No VGA input

5. No DLNA Support

6. Remote control has very small buttons and is not backlit.

7. External audio system suggested for best listening experience.

Final Take

In summing up my experience with the Vizio E420i, it was easy to unpack and set-up, and the physical styling was very appealing. Although I thought that the provided remote control could have had a better layout and larger buttons, navigating the TV's menu system was not difficult.

Also, the E420i delivered good quality images from high-def sources, and although wasn't perfect when faced with standard def or lower quality input signals, did a more than adequate job providing some image quality correction.

Viz o E420i Smart LED/LCD TV - Photo of the Remote Control

Photo © Robert Silva - Licensed to About.com

In addition, being equipped with both ethernet and WiFi connection options, reaching out to the internet to access streaming content was easy, with an abundance of content sources available.

On the other hand, not being able to access content stored on other devices connected within a home network was a little disappointing.

Combining all factors, the Vizio E420i is worth consideration for those that are budget conscious, but would still like a decent quality TV with internet streaming capability as their main set, or those looking an additional larger screen TV for a second room - certainly a good value for $499.

For a closer look at the Vizio E420i, also check out my Photo Profile and Video Performance Test Results.

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Disclosure: Review samples were provided by the manufacturer. For more information, please see our Ethics Policy.

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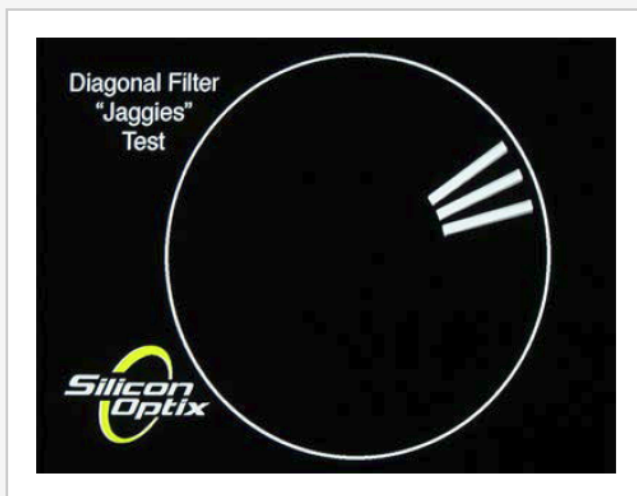[   ] [Search]

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Vizio E420i Smart LED/LCD TV - Video Performance Tests

By Robert Silva, About.com Guide

Vizio E420i Smart LED/LCD TV - Video Performance Tests

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Vizio E420i Review - HQV Benchmark DVD Video Quality Evaluation Test Disc - Test List

Photo © Robert Silva - Licensed to About.com

In order to test the video performance of the Vizio E420i LED/LCD TV, I used the standardized Silicon Optix (IDT) HQV DVD Benchmark Disc. The disc has a series of patterns and images that test how well a video processor in a Blu-ray Disc/DVD player, home theater receiver, or TV player can display a good quality image when face with a low resolution or poor quality source.

In this Step-by-Step look, the results of several of the provided tests listed in the list above are shown.

The tests were conducted with an Oppo DV-980H DVD Player connected directly to the E420i. The DVD player was set for NTSC 480i resolution and connected to the E420i alternately via both composite and HDMI cables, so that test results reflected the video processing performance of the E420i, which upscales the standard definition input signals to 1080p for display.

All tests were conducted using the E420i's factory default settings.

Screen shots for the test illustrations were made with a Sony DSC-R1 Digital Still Camera.

After going through this profile, also check out my Review, and Photo Profile.

Proceed through the tests...

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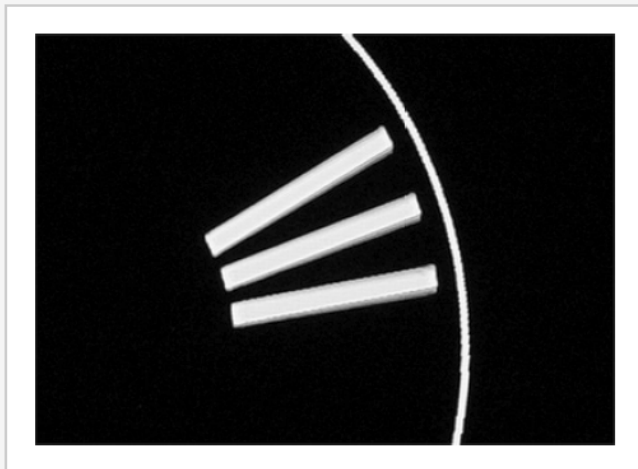
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Vizio E420i Smart LED/LCD TV - Video Performance Tests

By Robert Silva, About.com Guide

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Jaggies Test 1 - Example 1

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Here is a look at the first of a series of video performance tests that helps to reveal the deinterlacing and scaling capabilities of, in this case, the E420i. This first test (known as the Jaggies 1 Test) consists of diagonal bar that moves in a 360 degree motion within a circle. In order for the E420i to get a passing grade for this test, the rotating bar needs to be straight, or show minimal wrinkling or jaggedness, as it passes red, yellow, and green zones of the circle. Here, the rotating line is smooth, with just a very slight hint of roughness along portions of the edge, which means that the Vizio E420i passes this test. **Note:** Slight blurriness caused by the camera shutter, not the TV.

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Jaggies Test 1 - Example 2

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Here is a second look at the Jaggies 1 rotating bar test. Just as in the first example, the rotating line is smooth. The Vizio E420i also passes this portion of the test.

Proceed to the next photo for a final look at the rotating line test...

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Jaggies Test 1 - Example 3

Vizio E420i Smart LED/LCD TV Screen Photo of HQV Jaggies Test 1 - Example 3

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To conclude our look at the Jaggies 1 rotating bar test results for the Vizio E420i. The example shown here reveals that even when viewed close-up, the motion of the line shows only a slight hint of roughness along the edges (blurriness caused by camera shutter). The Vizio E420i definitely passes the Jaggies rotating bar test.

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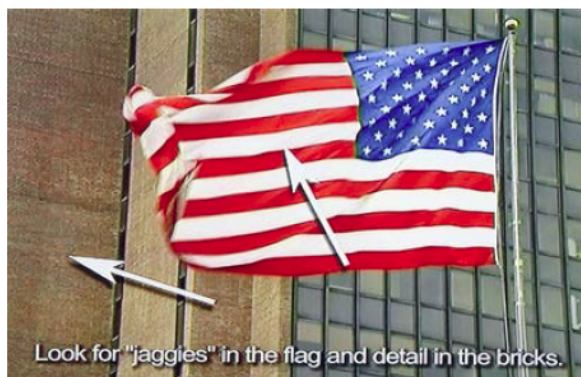
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By Robert Silva, About.com Guide

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Jaggies Test 2 - Example 1

Photo © Robert Silva - Licensed to About.com

In this test (known as the Jaggies 2 Test), three bars are moving and down in rapid motion. In order to pass this test, at least one of the lines needs to be straight. If two lines are straight that would be considered better, and if three lines were straight, the results would be considered excellent.

As you can see, the lines are not jagged or wrinkled. This means that the Vizio E420i passes this test. The E420i is doing well with the tests up to this point, but let's take a closer look.

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Jaggies Test 2 - Example 2

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Here is a close-up view of the Jaggies 2 Test illustrated on the previous page with the lines in a slightly different position.

The lines are not jagged or wrinkled, and the bottom line is only slightly rough along the edges. However, even with the slight roughness on the bottom line, the Vizio E420i does very well with this test and deserves a passing grade. However, there are more difficult tests ahead.

Proceed to the next test...

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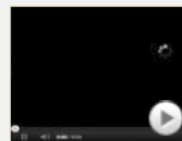
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Look for "jaggies" in the flag and detail in the bricks.

Vizio E420i Smart LED/LCD TV Screen Photo of HQV Flag Test - Example 1

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Although Passing the rotating and bouncing bars tests reveals one aspect of the Vizio E420i's video performance, a more complex challenge of how it can handle the complex combination of horizontal, vertical, and diagonal motion is to take a look at how well it does displaying a waving American Flag.

If the flag is jagged, the 480i/480p conversion and upscaling is considered below average. As you can see here (even when you click for the larger view), the interior stripes of the flag appear are very smooth smooth along the edges of the flag and within the stripes of the flag. This is considered an excellent result for this example of the test.

By proceeding to the next two photo examples, you will see the results with regards to the differing position of the flag as it waves.

Proceed to the next photo…

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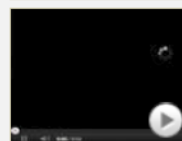
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Vizio E420i Smart LED/LCD TV - Photo - Flag Test - Example 2

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Look for "jaggies" in the flag and detail in the bricks.

Vizio E420i Smart LED/LCD TV Screen Photo of HQV Flag Test - Example 2

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Here is a second look at the waving flag test where motion of the flag is captures in a different position. As you can see here (even when you click for the larger view), the interior stripes of the flag appear are still smooth along the edges of the flag and within the stripes of the flag. The Vizio E420i is still passing this test.

By proceeding to the next photo, you will see a third results example.

Proceed to the next photo...

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Flag Test - Example 3

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Here is a third, and final, look at the flag test. Here the stripes are still fairly smooth, but there is some slight edge roughness were flag is extensively wrinkled. However, it is not excesslive and in real motion, is very difficult to notice.

Combining the three result examples of the Flag Waving Test shown in this profile, it appears that the 480i/480p conversion and 1080p upscaling ability of the Vizio E420i is very good so far.

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Race Car Test - Example 1

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Pictured on this page is one of the tests that shows how good the video processor of the Vizio E420i is at detecting 3:2 source material. Here, the TV has to be able to detect whether the source material is film based (24 frames per second) or video based (30 frames a second) and display the source material correctly on the screen, so as to avoid artifacts.

With the race car and grandstand shown in this photo, if the TV's video processor is poor the grandstand would display a moire pattern on the seats. However, if the Vizio E420i has good video processing, the Moire Pattern will not be visible or only visible during the first five frames of the cut.

As shown in this photo, there is no moire pattern visible at this point in the cut. This is definitely a good result for this test.

For another example of how this image should look, check out an example of this same test as performed by the video processor built into the Toshiba 47TL515U 3D Smart LED/LCD TV from a previous review used for comparison.

For a sample of how this test should not look, check out an example of this same deinterlacing/upscaling test as performed by the video processor built into a Toshiba 46UX600U LCD , from a past product review.

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Race Car Test - Example 2

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Here is a second photo of the "Race Car Test" as explained on the previous page.

In this second example of the "race car test", just as in the first example, there is no moire pattern as the image pans as the race car goes by.

When comparing this photo example with the previous example, the Vizio E420i definitely passes this test.

NOTE: Any blurring in the image is the result of the camera, not the TV.

For another sample of how this image should look, check out an example of this same test as performed by the Panasonic TC-P50GT30 Plasma TV from a previous review used for comparison.

For a sample of how this test should not look, check out an example of this same deinterlacing/upscaling test as performed by the video processor built into a Toshiba 46UX600U LCD , from a past product review.

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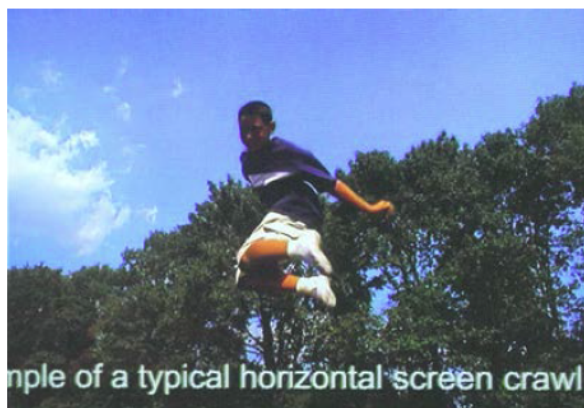[Search]

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By Robert Silva, About.com Guide

Vizio E420i Smart LED/LCD TV - Photo - Titles Test

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV Title Test

Photo © Robert Silva - Licensed to About.com

Even though the E420i is able to detect the difference between video and film-based sources, such as shown in the previous race car test photo, in order to provide good video performance, it must be able to detect both at the same time. The reason this capability is desired is that often video titles (moving at 30 frames per second) are laid over film (which is moving at 24 frames per second). The combination of both these elements can often times result in artifacts that make the titles look jagged or broken. However, if the Vizio E420i can detect the differences between the titles and the rest of the image, the titles should appear smooth.

As shown in this results example, the letters are smooth (the blurriness is due to the camera's shutter) and shows that the Vizio E420i detects and shows a very stable scrolling title image.

Proceed to the next test...

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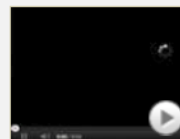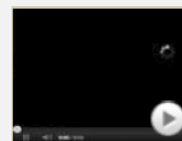- lcd tvs
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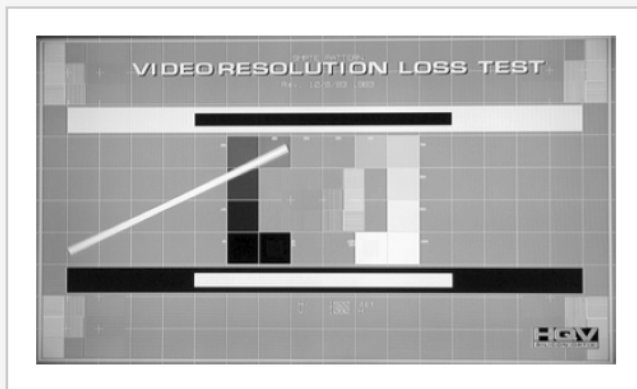- dvd

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV HD Loss Test

Photo © Robert Silva - Licensed to About.com

Here is a test that also provides information the video performance of the Vizio E420i as it relates to high-definition source material.

For this test, the source component used was the OPPO BDP-103 Blu-ray Disc player, and connected to the E420i using an HDMI connection.

The image coming from the BDP-103 was mastered in 1080i and placed on a Blu-ray Disc in that resolution. The BDP-103 in turn is set for 1080i output so that the originally recorded 1080i image is passed to the E420i.

In order to pass this test, the E420i needs to deinterlace the incoming 1080i signal on the disc and display it on the screen as a 1080p image.

However, an added task faced by the E420i is that it has to distinguish between the still and moving parts of the image. If the TV's processor does its job properly, the moving bar will be smooth and all of lines in the still part of the image will be visible at all times.

To better detect the processing result, the squares on each corner contain white lines on odd frames and black lines on even frames. If the blocks continuously show still lines, the E420i is doing a complete job at reproducing all of the resolution of the original image. However, if the square blocks are seen to vibrate or strobe alternately in black (see example) and white (see example), then the TV's video processor is not processing the full resolution of the entire image.

As you can see in this frame, the squares in the corners are displaying still lines. This means that these squares are being displayed properly as they are not showing a solid white or black square, but a square filled with alternating lines. In addition, the rotating bar appears smooth due to the size of this photo.

This result indicates that the E420i does well with 1080i to 1080p still and motion motion

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Vizio E420i Smart LED/LCD TV Screen Photo of HQV HD Loss Test - Close-up

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Here is a close-up look at the rotating bar portion of the test shown on the previous page. The image has been recorded in 1080i, which the Vizio E420i needs to reprocess as 1080p. If the processor is performing well, the moving bar will be smooth or show minimal roughness along the edge.

However, as seen in this close-up photo of the rotating bar, which appeared smooth in the previous photo, is still smooth in this added close-up view (the blurriness is caused by the camera shutter - not the TV). The E420i does very well with both 1080i to 1080p still image conversion, and 1080i to 1080p conversion with moving objects.

Final Note

Here is a summary of the additional tests performed that are not shown in the previous photo examples:

Color Bars: PASS

Detail (resolution enhancement): FAIR

Noise Reduction: FAIR

Mosquito Noise (the "buzzing" that can appear around objects): FAIR

Motion Adaptive Noise Reduction (noise and ghosting that can follow rapidly moving objects): FAIR

Assorted Cadences:

2-2 PASS

2-2-2-4 FAIL

2-3-3-2 FAIL

3-2-3-2-2 FAIL

5-5 FAIL

6-4 FAIL

8-7 FAIL

3:2 (Progressive Scan) - PASS

Looking back at the entirety of the test results, the Vizio E420i does a good job on many aspects of processing and scaling standard definition video for display on its 42-inch 1080p screen, such as minimizing motion and edge artifacts. However, the E420i only does an average job of extracting detail and suppressing video noise, and also displays some instability when faced with some commonly used, and not so commonly used, video and film frame cadences. For additional perspective on the Vizio e420i, plus a close-up photo look at its features and connection offerings, check out my Review and Photo Profile.

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 3                           EASTERN DIVISION

 4   IP INNOVATIONS LLC, et al.,     )  Docket No. 08 C 393
                                     )
 5                   Plaintiffs,     )
                                     )
 6            v.                     )  Chicago, Illinois
                                     )  November 12, 2009
 7   MITSUBISHI ELECTRIC CORPORATION, )  10:02 o'clock a.m.
     et al.,                         )
 8                                   )
                     Defendants.     )
 9
                    TRANSCRIPT OF PROCEEDINGS - STATUS
10                   BEFORE THE HONORABLE SUSAN E. COX

11   APPEARANCES:

12   For the Plaintiffs:          NIRO, SCAVONE, HALLER & NIRO, by
                                  MR. PAUL CHRISTOPHER GIBBONS
13                                181 West Madison Street
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14                                Chicago, Illinois 60602

15   For Defendant Microsoft:     SIDLEY AUSTIN LLP, by
                                  MS. JAMIE L. SECORD
16                                One South Dearborn Street
                                  Chicago, Illinois 60603

17

18   For Defendant Vizio:         LEVENFELD PEARLSTEIN LLC, by
                                  MR. CHRISTOPHER SCOTT GRIESMEYER
19                                Two North LaSalle Street
                                  Suite 1300
20                                Chicago, Illinois 60602

21                     ALEXANDRA ROTH, CSR, RPR
                        Official Court Reporter
22                    219 South Dearborn Street
                              Room 1224
23                    Chicago, Illinois 60604
                           (312) 408-5038
24

25   NOTE:  Please notify of correct speaker identification.
```

```
 1              MR. GIBBONS:  I know the feeling, your Honor.

 2              THE COURT:  But you should identify.  And what he's

 3    requested is for you to identify those televisions that -- that

 4    employ the technology.  I mean, I can't exactly remember, and I

 5    don't have it in front of me.  But it was the chicken and egg

 6    thing.  You wanted him to tell you.  He wants you to tell him.

 7    And what I'm saying is, Judge Nolan says, and I'm going to

 8    follow her, that you need to tell him.  So get on it.

 9              And then he's going to have to tell you or further

10    identify what his infringement position is.  Right?  Somebody

11    has got to go first.  And you know what?  It's you.

12              MR. ZARIAN:  I understand.

13              THE COURT:  That's what we are doing here.  So how

14    soon can you do that?

15              MR. ZARIAN:  Your Honor -- your Honor, we are not

16    talking about a specific interrogatory.  We are beyond that now

17    apparently because there is no specific interrogatory that I

18    asked for -- for that.

19              So if the Court tells me what it's ordering me without

20    a motion and without interrogatories (inaudible) --

21              THE COURT:  He had a motion.

22              MR. ZARIAN:  -- I can answer.

23              THE COURT:  I need a recess.

24              MR. ZARIAN:  Thank you, your Honor.

25              THE COURT:  And I think I want to see you guys in
```

A006597

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Write down the serial number located on the back of your VP505XVT1A.__ __ __ __ __ __ __ __ __ __ __ __ __ __

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Press the **GUIDE** button once on the remote and program information for the channel you are watching will be displayed on the screen.

Press the ◄ or ► button to scroll the previous or next channel. Each time you pause at a channel, the program list will update with the program schedule for the channel and the window will show the live program for that channel. Press the **GUIDE** button to exit this feature.

Antenna   Monday, 6-December-2004 6:35:35 PM

20-2 ◄   11-1 WPIX-DT   ► 11-2

Today	6:30 PM	Will & Grace	CC
Today	7:00 PM	Friends	CC
Today	7:30 PM	Everybody Loves Raymond	CC
Today	8:00 PM	7th Heaven	CC
Today	9:00 PM	Everwood	CC
Today	10:00 PM	WB11 News at Ten	CC

6:30 PM - 7:00 PM Mon, 6-Dec   TV-14
(No program details.)

11-1 WPIX-DT
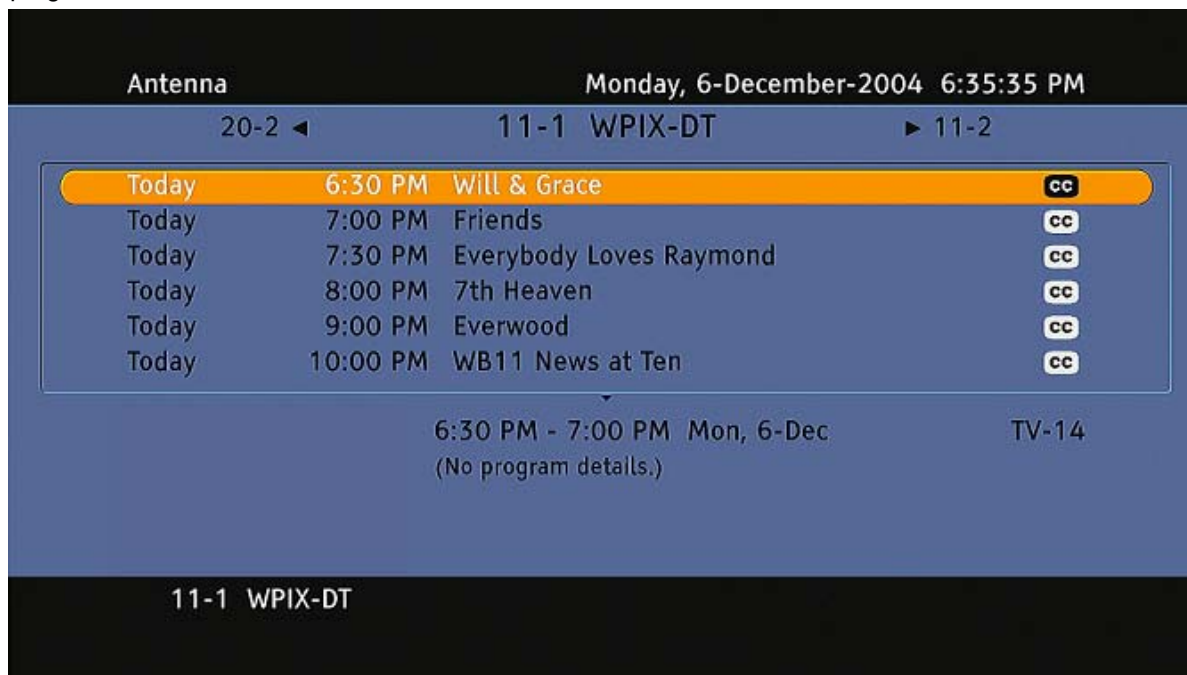
3.6 Information on FHDTV Status

When you change TV channels or inputs, or press the **GUIDE** button on the remote, an Information Banner is displayed for a few seconds to tell you the status of the TV.
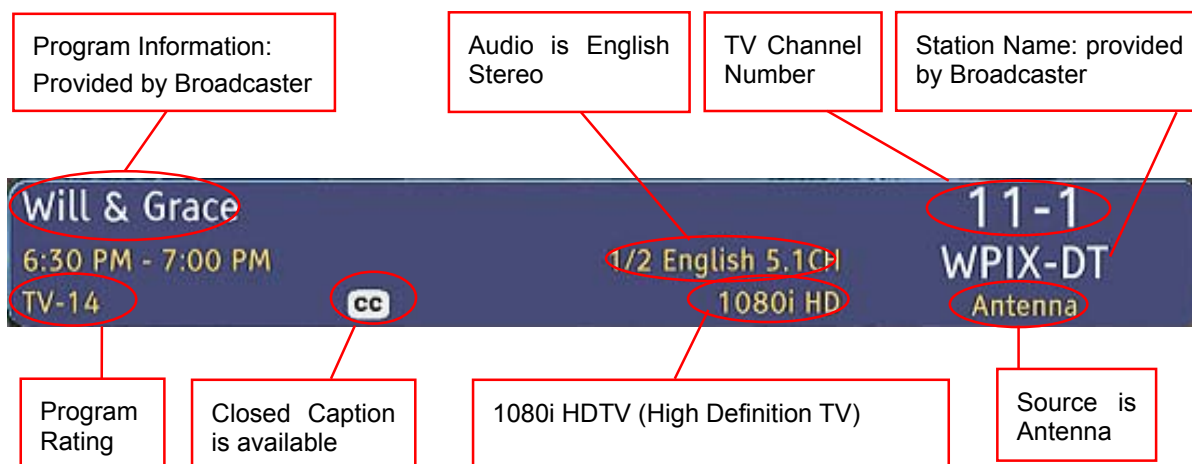
Program Information: Provided by Broadcaster

Audio is English Stereo

TV Channel Number

Station Name: provided by Broadcaster

Will & Grace
6:30 PM - 7:00 PM
TV-14   CC   1/2 English 5.1CH
1080i HD
11-1
WPIX-DT
Antenna

Program Rating

Closed Caption is available

1080i HDTV (High Definition TV)

Source is Antenna

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new models, offering increased contrast ratio and longer life

- Exciting performance and price breakthroughs in 50" and 60" Full 1080p

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- An all-in-one solution with plasma flat panel display and complete 5.1-

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- Four other models, ranging from 32" to 50", offer astonishing prices for

native 720p plasma HDTVs

- VIZIO's 1080p 50" model is the world's first plasma TV to offer Silicon

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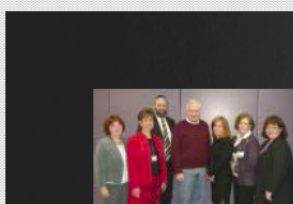
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Flat Panel HDTV Company, today introduced seven new plasma High-Definition
Televisions with advanced processing power and the latest technological
advancements. Offerings will include the feature rich VP504F-50" Full High
Definition, 1080p Plasma Display featuring Silicon Optix HQV Processing and
the all new VP605F-60" Full high-Definition 10800p display. In addition,
VIZIO will release the all new VIZIO VP series of products including the
VP322-32" Plasma ($689), VP422-42" Plasma ($999), VP423-42" Plasma ($999),
and VP503-50" Plasma ($1399) all with High Definition 720p technology.
VIZIO also reintroduces the VIZIO Jive VP500 and new VP501 All-in-One home
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Digital 5.1 surround sound system, now also featuring a move to 1080p
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(Hollywood Quality Video) Processing

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technology displays. While the new VIZIO VP605F boasts 60" of large screen
high definition 1080p performance to capture the imagination of even the
most discerning of consumers, the 50" VIZIO VP504F packs an enhanced punch
with integrated Silicon Optix's REON HQV chip, ensuring the sharpest and
most detailed image possible. Silicon Optix HQV's advanced noise reduction
removes noise and artifacts caused by signal compression from cable and
satellite providers. Since the HQV's REON chip can process two full

features full-screen display allowing the highest resolution
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finest details. VIZIO's new 1080p plasma HDTV's, the VP504F and VP605F are
compatible with all of today's popular input resolutions [1080p, 1080i,
720p, 480p and 480i] and use an integrated, DTV-compliant HD/QAM tuner so
users can enjoy high definition and regular television programs with or
without paid high definition service.

Both models are significantly brighter than previous VIZIO plasma
models boasting an amazing contrast ratio up to 30,000:1 and include four
HDMI v1.3 inputs, two of which are available as a side access HD Game port.
Independent RGB adjustments allow users to fine-tune the sets' color
settings plus a new remote control makes it even easier to operate TV and
other system component functions.

Additional feature sets include true four-field motion adaptive de-
interlace, 10-bit diagonal interpolator which removes jagged or stair step
artifacts from de-interlaced video sources and true 10-bit processing which
output 4:4:4 color processing which renders more than one billion colors.

VIZIO sets itself apart from the crowd in 2008 by being the first
manufacturer to include a 6' HDMI cable within the carton in lieu of
commonly inserted composite video and audio cables. HDMI allows the highest
level of High Definition television video and audio to be transmitted
through a single cable. VIZIO wants customers to experience the truest HD
quality experience with their new VIZIO plasma display as well as a new
side access HD Game port including 2 HDMI v1.3 inputs.

The new VIZIO VP504F and VIZIO VP605F are expected to launch in June
2008 with estimated selling prices of $1699 and $2899.

VIZIO VP500 and VP501

In 2007, VIZIO introduced the VIZIO Jive JV50P All-in-One home theatre
solution which included a 50" Plasma High-Definition display and Dolby
Digital 5.1 surround sound. VIZIO was the first TV manufacturer to offer
this complete Home Theater solution and has improved its performance and
capability.

For 2008, the VIZIO VP500 and new VIZIO VP501 will share honors in the
growing popularity of home theatre enthusiast market in the All-in-One
solution category. While the VP500 will retain its 50" Plasma technology
and 720p resolution, its newest sibling will step it up a notch with Full
High Definition 1080p performance. Each model will offer
Picture-in-Picture, Picture-on-Picture, three HDMI, two component video,
two composite and one RF input.

What makes the VIZIO VP500 system so unique however is the Dolby
Digital 5.1 surround-sound system. Working in concert with integrated
front, left /right speakers and center channel are two rear channel (left
and right) speakers attached to a subwoofer. The subwoofer attaches
wirelessly through 2.4GHz transmission to the VP500 system, completing the
home theatre experience and eliminating wire clutter commonly experienced
with other home theatre systems. The VIZIO Jive generates more than ample
sound, even for the discerning listener pumping 560-watts total peak power
(70-watts RMS) of high quality digital sound to maximize your VIZIO High
Definition television experience.

In 2008, VIZIO will now include its all new, prized brushed aluminum-
trimmed Learning remote control (VUR8). This remote control compliments the
elegance of the VP500 and VP501 design with full-featured functionality
including Picture-in-Picture controls.

The new VIZIO VP500 is expected to arrive in stores June 2008 with an
estimated selling price of $1799. Pricing and availability on the new VP501
has not been set.

VIZIO VP322, VIZIO VP422, VIZIO VP423, VIZIO VP503

Rounding out VIZIO's family of plasma displays are the VP322, VP422,
and VP423 all offering stunning 720p performance, rich deep black levels,
outstanding color rendering and the latest connectivity options including
HDMI version 1.3 inputs. All of VIZIO's high performance plasma's offer
extremely fluid and uninterrupted motion, a significant advantage over LCD
flat panels. Plasma TVs continue to be a leading choice for watching
sporting events and action-packed movies.

The VP324 is a 32-inch set with 1024 X 720 resolution for consumers
that would like the picture qualities of plasma but in a small cabinet
size. The set's exceptional 15,000:1 contrast ratio ensures images have
rich, deep blacks and brilliant colors providing a cost effective solution
for displaying HD broadcast content and playing HD-DVD and Blu-Ray discs,
which can be connected to one of the three HDMI video inputs.

The VP422/VP423 are VIZIO's 42-inch Plasma models with 1024 x 768
resolution, 20:000:1 contrast ratio and two HDMI inputs. Two 42" models,
the VP422 will sell in discount retailers such as Wal-Mart and K-Mart and
the VP423 will head for the shelves at club retailers such as Costco and
Sam's Club, as well as traditional consumer electronics retailers like
Circuit City and Sears. Also providing two HDMI inputs, the VP503 is a
50-inch plasma set that delivers a native resolution of 1365 x 768, is
compatible with 1080p content, and displays a bright, rich image due to its
30,000:1 contrast ratio.

"Great looking plasma HDTVs including Full 1080p HD models are now

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VIZIO Introduces New Generation Plasma TVs Including Full 1080p HD Models and -- re> IRVINE, Calif , Jan 6 /PRNewswire/ --

Case 2:12-cv-05707-MRP-E   Document 61-2   Filed 08/19/13   Page 413   Filed 11/06/2014   Page ID #:6210

vice president sales for VIZIO, Inc. "We have successfully brought the best
plasma technologies such as Silicon Optix's REON HQV video processing and
features to high value flat panel TVs. We continue to find new ways to
integrate the most- desired features and technologies, while keeping our
products at the most reasonable prices in the industry."

    The new VIZIO VP324, VP422, VP423, and VP503 are expected in May or
June 2008 with estimated selling prices of $689, $999, $999 and $1399
respectively.

    VIZIO will be displaying many of these models along with several other
2008 product introductions at their suite in the Wynn Hotel during CES.

    About VIZIO

    VIZIO, Inc. "Where Vision Meets Value," headquartered in Irvine,
California, is America's Fastest Growing Flat Panel HDTV Company. The VIZIO
brand has been seen and heard on TV and radio, including NBC's Today Show,
ABC's Good Morning America and Live with Regis and Kelly, won numerous
awards from leading publications including Good Housekeeping's Best
Big-Screens, CNET's Top 10 Holiday Gifts, PC World's Best Buy, Sound &
Vision's Editors Choice, Home Theater Magazine's Rave Award, PC Magazine's
Editors Choice, AVRev.com's #1 Product We Love the Best and The Perfect
Vision's Products of the Year. VIZIO is bringing vision to the consumer
electronics market through practical innovation. VIZIO products offer
customers advanced technologies at the most affordable value. Products
include the VIZIO, Maximvs and Gallevia lines of Plasma and LCD HDTVs. Many
of these products can be found at BJ's Wholesale, Circuit City, Costco
Wholesale, Sam's Club, Sears, Wal-Mart, and other retailers nationwide
along with authorized online partners. For more information, please call
888-VIZIOCE or visit on the web at www.VIZIO.com.

    The V, VIZIO, Gallevia, Maximvs, Where Vision Meets Value names, phase
and symbols are trademarks or registered trademarks of VIZIO, Inc. All
other trademarks may be the property of their respective holders.

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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD., Plaintiff, v. SEARS HOLDINGS CORPORATION and VIZIO, INC., Defendants.	Case No. CV12-5707 MRP (E) *Assigned to the Honorable Mariana R. Pfaelzer* **EXPERT REPORT OF J. CARL COOPER**

A006896

1 said spatial pixels, said known values of said spatial pixels, and a plurality of

2 constants, said logical operations selected from the group consisting of greater

3 than, greater than or equal to , less than, less than or equal to, 'and', 'or', and

4 'xor'."

5   88.   Figure 7 does not illustrate logical operations on linear combinations

6 of values selected from the Markush group. Specifically, the logical operations in

7 Figure 7 are performed on the absolute values of the difference between two spatial

8 pixels. As explained above, the absolute value of the difference between two

9 spatial pixels is not part of the Markush group. Notably, the absolute value of

10 differences between the value of spatial and temporal pixels is also not part of the

11 Markush group, although there is a Markush element dealing with the absolute

12 value of differences of averages of spatial and temporal pixels.

13   89.   Dr. Hemami also points to Figure 9. Cooper states at Col. 17:41-47,

14 "FIG. 12 shows as an alternate embodiment of the video fill and D-A converter 35

15 of FIG. 10 in applications depicted by FIG. 9. The function of the preferred

16 embodiment described with respect to FIG. 12 is to generate a fill element which is

17 similar or equivalent to element X. This embodiment of FIG. 12 generates a fill

18 element, for use as element X of FIG. 7 or 9, in response to the video fill or

19 replication signal from FIG. 11." Fig. 11 shows a rank logic circuit 27 which

20 performs logical operations on the absolute values of pairs of pixels A through H

21 of Fig. 10 and shown graphically in Figs. 7 & 9. Note it is not the absolute values

22 of averages of pixels, as mentioned above. The pairs used in Fig. 11 are A-H, B-G,

23 C-F, D-E, B-E, E-G, G-D, D-B. Importantly, when the missing pixel to be created

24

-30-

1 is X all of the differences are taken from temporal pixels. None of the absolute

2 values of the differences are part of the Markush group.

3   90.   Dr. Hemami's contention that it would have been obvious to modify

4 Cooper to perform the claimed methods is false. Cooper contemplates using the

5 absolute value of differences of pixel pairs, but this is not part of the Markush

6 group. It would not have been obvious to modify Cooper to use values from the

7 Markush group instead.

8   91.   Cooper does not disclose the evaluation of logical operations of linear

9 combinations of values selected from the Markush group of claims 7 and 14.

10   92.   It is thus my opinion that Cooper does not anticipate claims 7 and 14

11 of the '842 patent.

12   93.   Because claims 8 and 9 are dependent on claim 7, they are likewise

13 not anticipated by Cooper.

14   94.   Because claim 15 is dependent on claim 14, it is likewise not

15 anticipated by Cooper.

16 **F.   Kovacevic, U.S. Patent No. 5,661,525 ("Kovacevic") in view of
        Markandey or Rabii**

17

18   95.   It is my opinion that claims 7-9 and 14-15 of the '842 Patent are not

19 invalid as anticipated by Kovacevic. Kovacevic does not disclose all of the

20 required limitations of the asserted claims.

21   96.   It is additionally my opinion that claims 7-9 and 14-15 of the '842

22 Patent are not obvious over Kovacevic in view of Markandey or Rabii. As

23 discussed within this report, each of these references is missing at least one

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17   UNITED STATES DISTRICT COURT

18   CENTRAL DISTRICT OF CALIFORNIA

19   WESTERN DIVISION

20 OPLUS TECHNOLOGIES, LTD., | CASE NO.: CV12-5707 MRP (E)

21   Plaintiff, | Hon. Mariana R. Pfaelzer

22 v.

23 SEARS HOLDINGS CORPORATION, | **DEFENDANT VIZIO INC.'S**
   VIZIO, INC., | **SECOND SUPPLEMENTAL AND**
                                       | **AMENDED OBJECTIONS AND**
24   Defendants. | **RESPONSES TO PLAINTIFF OPLUS**
                                       | **TECHNOLOGIES, LTD.'S**
25 | **AMENDED INTERROGATORIES**
                                       | **(NOS. 1, 7, AND 11)**
26

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DEFENDANT VIZIO INC.'S SECOND SUPPLEMENTAL AND AMENDED OBJECTIONS AND RESPONSES TO
PLAINTIFF OPLUS TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES

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1   Pursuant to Federal Rule of Civil Procedure 33, Defendant VIZIO, Inc.

2   ("VIZIO") hereby provides its second supplemental and amended objections and

3   responses to Oplus Technologies, Ltd.'s ("Oplus") Amended Interrogatories.

4   **GENERAL OBJECTIONS**

5   VIZIO generally objects to these Interrogatories and their accompanying

6   Definitions and Instructions on the following grounds, which are incorporated into

7   and made a part of VIZIO's response to each and every individual Interrogatory:

8   1.   VIZIO objects to the extent the Interrogatories seek to impose

9   obligations upon VIZIO not required by the Federal Rules of Civil Procedure, the

10 Local Rules for the United States District Court for the Central District of California

11 ("Local Rules"), or the Orders of the Court. VIZIO's responses shall be controlled by

12 and comply with the requirements of the Federal Rules of Civil Procedure, the Local

13 Rules, and the Orders of the Court.

14   2.   VIZIO objects to the extent the Interrogatories call for the disclosure of

15 information subject to the attorney-client privilege, the attorney work-product

16 doctrine, or any other applicable privileges. Such information will not be provided.

17   3.   VIZIO objects to the definition of "Defendant" and "VIZIO" as

18 including "any of [VIZIO's] respective predecessors, successors, parents,

19 subsidiaries, divisions, related companies and other business entities controlled by it,

20 as well as its officers, directors, employees, agents, and each person acting or

21 purporting to act on its behalf or under its control." This definition is impermissibly

22 vague, ambiguous, and overly broad, and renders any related requests unduly

23 burdensome, unreasonable, and oppressive. VIZIO shall limit the terms "Defendant"

24 and "VIZIO" to mean VIZIO, Inc. and its subsidiaries.

25   4.   VIZIO objects to the definitions of "identify" and "locate" to the extent

26 that they purport to impose obligations greater than those set forth in the Federal

27 Rules of Civil Procedure.

28   5.   VIZIO's General Objections shall be deemed continuing as to each

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Interrogatory, incorporated in response to each Interrogatory whether or not

specifically stated in response to each Interrogatory, and are not waived or in any way

limited by the following responses.

SPECIFIC RESPONSES AND OBJECTIONS

AMENDED INTERROGATORY NO. 1:

Identify all Relevant Products by product number, trade name, and/or other

designation.

SECOND SUPPLEMENTAL RESPONSE TO AMENDED

INTERROGATORY NO. 1:

VIZIO incorporates by reference each of the foregoing General Objections.

VIZIO objects to this Interrogatory on the grounds that this Interrogatory seeks

information that is not relevant to this action or likely to lead to the discovery of

admissible evidence.

VIZIO further objects to the definition of "Relevant Products" to the extent this

definition has been superseded by the products and technologies accused in Oplus'

June 14, 2013 Amended Infringement Contentions. VIZIO further objects to this

definition to the extent it implies that any of VIZIO's products falling within Oplus'

overbroad definitions are relevant in any way to this case.

Subject to and without waiver of the foregoing general and specific objections,

VIZIO responds as follows:

VIZIO identifies the following products sold on or after December 1, 2005 that

were specifically identified by Oplus in Oplus' June 14, 2013 Amended Infringement

Contentions or that VIZIO was able to identify as using Silicon Optix HQV

technology, Faroudja DCDi technology, or MediaTek MDDi motion adaptive

deinterlacing technology:

P50HDTV10A, P50HDM, VM60P, GV46L, L13, JV50P, VP505XVT,

VP504F, L42HDTV10A, GV42L, VW46L FHDTV10A, L37HDTV, P42HDTV10A,

VX32L, VW32L, and VX37L.

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VIZIO does not admit that any of the above-identified products are "relevant products." As set forth in detail in the July 10, 2013 Rebuttal Expert Report of Dr. Sheila S. Hemami Regarding VIZIO's Non-infringement of U.S. Patent Nos. 6,239,842 and 7,271,840, incorporated by this reference, none of these products are capable of infringing either the '842 or '840 Patent claims asserted by Oplus and many do not contain the technologies described by Oplus.

AMENDED INTERROGATORY NO. 7:

State the annual sales and gross profits by product for each of the Relevant Products and any additional products identified in response to Interrogatory No. 1, dating back to the year when each product was first publicly introduced in the United States or 2006 (whichever is later).

SECOND SUPPLEMENTAL RESPONSE TO AMENDED

INTERROGATORY NO. 7:

VIZIO incorporates by reference each of the foregoing General Objections.

VIZIO further incorporates by reference each of its Specific Objections to Amended Interrogatory No. 1.

VIZIO further objects to the extent this Interrogatory as overly broad, unduly burdensome, harassing, and neither relevant to a claim or defense of a party nor reasonably calculated to lead to the discovery of admissible evidence to the extent it seeks information "dating back to the year when each product was first publicly introduced in the United States or 2006 (whichever is later)."

Subject to and without waiver of the foregoing general and specific objections, VIZIO responds as follows:

VIZIO has determined that none of the products identified in VIZIO's Second and Amended Supplemental Response to Oplus' Amended Interrogatory No. 1 were on sale on the date of or after the filing of Oplus' Complaint. Thus, no non-privileged, relevant documents responsive to this Interrogatory exist, as detailed below.

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1   The "annual sales and gross profits" for VIZIO products that were on sale only

2   prior to Oplus' filing of its Complaint on December 1, 2011 are irrelevant to this case.

3   Oplus' claims for direct infringement in this case are based solely and expressly on

4   use by VIZIO of the accused products. *See* Oplus' June 14, 2013 Amended

5   Infringement Contentions at Exh. A at 1, Exh. B at 1, Exh. C at 1, and Exh. D at 1

6   ("Vizio has infringed . . . within the meaning of 35 U.S.C. 271(a) by **using** televisions

7   or displays . . .") (emphasis added). In fact, the only "use" alleged by Oplus is

8   VIZIO's own *de minimis* "use" of turning on a sample television prior to the mass

9   production of each model, and the occasional use of a sample television at a trade

10   show. *See id.*; *see also* Deposition of Kenneth Lowe at 40:10-17, 60:2-6, and 69:10-

11   13. Sales information is wholly irrelevant to direct infringement claims based solely

12   on VIZIO's use, not its end-users' use, of its televisions. *See Ricoh Co., Ltd. v.*

13   *Quanta Computer Inc.*, 550 F. 3d 1325, 1335 (Fed. Cir. 2008) ("Accordingly, we hold

14   that a party that sells or offers to sell software containing instructions to perform a

15   patented method does not infringe the patent under § 271(a)."); *NTP, Inc. v. Research*

16   *In Motion, Ltd.*, 418 F.3d 1282, 1320-21 (Fed. Cir. 2005) ("Thus, the legislative

17   history of section 271(a) indicates Congress's understanding that method claims could

18   only be directly infringed by use …. The legislative history cited with respect to the

19   sell and offer to sell provisions indicates that Congress did not consider the 'import'

20   prong of section 271(a) to apply to method claims."); *Joy Techs., Inc. v. Flakt, Inc.,* 6

21   F.3d 770, 773 (Fed. Cir. 1993) ("The law is unequivocal that the sale of equipment to

22   perform a process is not a sale of the process within the meaning of section 271(a).");

23   *id.* at 774-75 ("[A] method claim is not directly infringed by the sale of an apparatus

24   even though it is capable of performing only the patented method. The sale of the

25   apparatus is not a sale of the method. A method claim is directly infringed only by

26   one practicing the patented method."); *see also Embrex, Inc. v. Service Eng'g. Corp.,*

27   216 F.3d 1343, 1350 (Fed. Cir. 2000) ("[B]ecause the sale of devices that may be

28   used to practice a patented method cannot infringe without proof of direct

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1   infringement, SEC's offers to sell its machines cannot supply adequate evidentiary

2   support for a compensatory damage award. Because the only cognizable

3   infringement in this case is the testing and those tests were not shown to cause any

4   loss of profits to Embrex, this court vacates the district court's award of $500,000 in

5   direct damages.").

6   Oplus also claims, without more, that "Vizio also induces and contributes to

7   infringement within the meaning of 35 U.S.C. 271(b) and 35 U.S.C. 271(c), wherein

8   the direct infringement is performed by the end users of the accused Vizio

9   televisions." *See* Oplus' June 14, 2013 Amended Infringement Contentions at Exh. A

10 at 1, Exh. B at 1, Exh. C at 1, and Exh. D at 1. However, both contributory

11 infringement and inducement of infringement require, at a minimum, actual

12 knowledge of the patents that are allegedly infringed. *Synqor, Inc. v. Artesyn Techs.,*

13 *Inc.,* 709 F.3d 1365 (Fed. Cir. 2013) (citing *Global-Tech Appliances, Inc. v. SEB S.A.,*

14 131 S. Ct. 2060, 2068, 179 L. Ed. 2d 1167 (2011)) ("Liability for induced or

15 contributory infringement under § 271(b) or (c) requires 'knowledge that the induced

16 acts constitute patent infringement.' This includes, in part, actual 'knowledge of the

17 existence of the patent that is infringed.'"). Oplus has not established any notice of

18 the asserted patents prior to the filing of its Complaint on December 1, 2011, and

19 VIZIO had no such notice. Thus, because each of the products identified in response

20 to Oplus' Amended Interrogatory No. 1 were sold prior to the filing of Oplus'

21 Complaint, and before VIZIO had any knowledge of the asserted patents, sales

22 information for these products is irrelevant to Oplus' indirect infringement claims on

23 this ground alone. Other compelling reasons why Oplus cannot show any basis for

24 seeking sales information for the accused products based on its completely

25 unsupported indirect infringement claims are set forth in detail in the July 10, 2013

26 Rebuttal Expert Report of Dr. Sheila S. Hemami Regarding VIZIO's Non-

27 infringement of U.S. Patent Nos. 6,239,842 and 7,271,840, incorporated by this

28 reference.

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AMENDED INTERROGATORY NO. 11:

State and describe in detail the design and development history of each of the Relevant Products from 2006 to the present including the date that design/development commenced and the identity of all versions of the Relevant Products.

SECOND SUPPLEMENTAL RESPONSE TO AMENDED INTERROGATORY NO. 11:

VIZIO incorporates by reference each of the foregoing General Objections.

VIZIO further objects to Amended Interrogatory No. 11 as improperly compound as it calls for information on at least three distinct subjects:

(1) Description of the design and development history of each of the alleged Relevant Products;

(2) The dates on which the design and/or development of each Relevant Product commenced; and

(3) The identity of all versions of the alleged Relevant Products.

Each of these distinct subjects includes at least eighteen additional discrete subparts because they seek information about all of the accused products and Oplus has accused at least eighteen different VIZIO products. *See, e.g., Collaboration Properties, Inc. v. Polycom, Inc.*, 224 F.R.D. 473, 474-75 (N.D. Cal. 2004) (each interrogatory which sought information about all 26 accused products has 26 discrete subparts). To the extent the number of interrogatories served by Oplus, including each of the discrete subparts contained in these Interrogatories, exceed 25 as permitted by Federal Rule of Civil Procedure 33(a)(1), such interrogatories should be stricken absent a court order pursuant to Federal Rule of Civil Procedure 26(b)(2).

VIZIO further objects to these Interrogatories as vague and ambiguous to the extent the phrases "design and development history," and "versions" are not defined or understood.

VIZIO further objects to the extent these Interrogatories seek information that

1 is not in VIZIO's possession, custody, or control. *See, e.g.,* Oplus' July 21, 2012

2 Judicial Panel on Multidistrict Litigation Reply Brief at 3 ("**Plainly, none of the**

3 **discovery to be had about the technical details of such accused products can be**

4 **obtained in California**.") (emphasis added).

5   Subject to and without waiver of the foregoing general and specific objections,

6 VIZIO responds as follows:

7   VIZIO does not design or manufacture the accused products. For purposes of

8 this case, VIZIO believes that the parties who supply these products and their

9 components have the most knowledge regarding their design and development.

10 Specifically, the companies that developed and/or currently own the rights to the three

11 confidential and proprietary technologies that Oplus has accused of infringement, *i.e.,*

12 Silicon Optix HQV technology, Faroudja DCDi technology, and MediaTek MDDi

13 motion adaptive deinterlacing technology (*see* Oplus' Amended Infringement

14 Contentions at Exh. A at 1, Exh. B at 1, Exh. C at 1, and Exh. D at 1), have the most

15 knowledge regarding the design and development of these technologies.

16   In further response to this interrogatory and pursuant to Fed. R. Civ. P. 33(d),

17 VIZIO also has produced the following documents: VIZIO002381 – VIZIO003545.

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Dated: July 23, 2013

Respectfully submitted,

By: /s/ Charles C. Koole

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A007363

VERIFICATION OF VIZIO, INC.'S SECOND SUPPLEMENTAL AND AMENDED OBJECTIONS AND RESPONSES TO OPLUS TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES (NOS. 1, 7, AND 11)

I, Rob Brinkman, declare, under penalty of perjury under the laws of the United States of America, that the following statements are true:

1.   I am Chief Administrative Officer of VIZIO, Inc. ("VIZIO"), and am duly authorized to sign this verification on behalf of VIZIO.

2.   I have read the foregoing VIZIO, INC.'S SECOND SUPPLEMENTAL AND AMENDED OBJECTIONS AND RESPONSES TO OPLUS TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES (NOS. 1, 7, AND 11) and know its contents.

3.   I am informed and believe and on that ground allege that the matters stated in the foregoing document are true.

Executed on this _____ day of July 2013 at Irvine, California.

_____

Rob Brinkman

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PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF LOS ANGELES

I am employed in the County of Los Angeles, State of California; I am over the age of 18 and not a party to the within action; my business address is 10250 Constellation Boulevard, 19th Floor, Los Angeles, California 90067.

On July 23, 2013, I served the foregoing document(s) described as

DEFENDANT VIZIO INC.'S SECOND SUPPLEMENTAL AND AMENDED OBJECTIONS AND RESPONSES TO PLAINTIFF OPLUS TECHNOLOGIES, LTD.'S AMENDED INTERROGATORIES (NOS. 1, 7, AND 11)

DEFENDANT VIZIO INC.'S SECOND SUPPLEMENTAL AND AMENDED RESPONSES TO PLAINTIFF OPLUS TECHNOLOGIES, LTD.'S FIRST SET OF REQUESTS FOR PRODUCTION OF DOCUMENTS

on the interested parties to this action by delivering a copy thereof in a sealed envelope addressed to each of said interested parties at the following address(es):

SEE ATTACHED LIST

☐ **(BY MAIL)** I am readily familiar with the business practice for collection and processing of correspondence for mailing with the United States Postal Service. This correspondence shall be deposited with the United States Postal Service this same day in the ordinary course of business at our Firm's office address in Los Angeles, California. Service made pursuant to this paragraph, upon motion of a party served, shall be presumed invalid if the postal cancellation date of postage meter date on the envelope is more than one day after the date of deposit for mailing contained in this affidavit.

☐ **(BY ELECTRONIC SERVICE)** by causing the foregoing document(s) to be electronically filed using the Court's Electronic Filing System which constitutes service of the filed document(s) on the individual(s) listed on the attached mailing list.

☒ **(BY E-MAIL SERVICE)** I caused such document to be delivered electronically via e-mail to the e-mail address of the addressee(s) set forth in the attached service list.

☐ **(BY OVERNIGHT DELIVERY)** I served the foregoing document by FedEx, an express service carrier which provides overnight delivery, as follows: I placed true copies of the foregoing document in sealed envelopes or packages designated by the express service carrier, addressed to each interested party as set forth above, with fees for overnight delivery paid or provided for.

☐ **(BY FACSIMILE)** I caused the above-referenced document to be transmitted to the interested parties via facsimile transmission to the fax number(s) as stated on the attached service list.

☐ **(BY PERSONAL SERVICE)** I caused such envelope to be delivered by hand to the offices of the above named addressee(s).

☒ (Federal) I declare that I am employed in the office of a member of the bar of this court at whose direction the service was made. I declare under penalty of perjury that the above is true and correct.

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Executed on July 23, 2013, at Los Angeles, California.

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Yanika Childers

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SERVICE LIST

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Gabriel I. Optaken (gopatken@nshn.com)

10 | NIRO, HALLER & NIRO

11 | 181 W. Madison, Suite 4600
Chicago, IL 60602

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Glaser Weil Fink Jacobs
Howard Avchen & Shapiro LLP

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A007367

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD.,   )

)

                 Plaintiff,   )

)

   vs.   ) Case No. CV12-5707 MRP(E)

)

SEARS HOLDINGS CORPORATION   )

and VIZIO, INC.,   )

)

                 Defendants.   )

_____)

CONFIDENTIAL - ATTORNEYS' EYES ONLY

     VIDEOTAPED 30(B)(6) DEPOSITION of VIZIO,

 INC. (KENNETH ROY LOWE), taken on behalf of

 Oplus Technologies, Ltd., at 18000 Von Karman

 Avenue, Irvine, California, commencing at

 9:32 a.m., Friday, May 10, 2013, before

 Michelle Hutton, C.S.R. 7322.

83
Kenneth Lowe   May 10, 2013

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Kenneth Lowe   May 10, 2013

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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

OPLUS TECHNOLOGIES, LTD.,   )

)

                Plaintiff,)

)

   vs.   ) Case No. CV12-5707 MRP(E)

)

SEARS HOLDINGS CORPORATION   )

and VIZIO, INC.,   )

)

                Defendants.)

_____)

CONFIDENTIAL - ATTORNEYS' EYES ONLY

VIDEOTAPED 30(B)(6) DEPOSITION of VIZIO,

INC. (ROBERT BRINKMAN), taken on behalf of

Oplus Technologies, Ltd., at 18000 Von Karman

Avenue, Irvine, California, commencing at

9:28 a.m., Thursday, May 9, 2013, before

Michelle Hutton, C.S.R. 7322.

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Robert Brinkman   May 9, 2013

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